In the Supreme Court of the United States.

October Term, 1905.

THE STATE OF GEORGIA, BY ITS ATTORNEY-GENERAL, JOHN C. HART, Plaintiff,		
vs.	}	In Equity.
THE TENNESSEE COPPER COMPANY AND THE DUCKTOWN SULPHUR, COPPER AND IRON COMPANY (LIMITED), Defendants.		

Now comes the State of Georgia, by its Attorney-General, John C. Hart, and Ligon Johnson, Special Counsel, and moves the Court that the State of Georgia be permitted to file its bill of complaint in equity against the Tennessee Copper Company, a corporation organized and existing under the laws of the State of New Jersey, but a denizen of the State of Tennessee, and the Ducktown Sulphur, Copper and Iron Company (limited), a corporation of Great Britain, and also a resident of Tennessee, as a cause of which this Court has jurisdiction under Section 2, Article III, of the Constitution of the United States, and that upon the filing thereof a subpœna issue as provided by rule twelve of the Rules of Practice in Equity.

THE STATE OF GEORGIA,
By JOHN C. HART,
Attorney-General.
LIGON JOHNSON,
Special Counsel.

No. _____

IN THE SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1905.

THE STATE OF GEORGIA, BY ITS ATTORNEY-GENERAL,
JOHN C. HART,
Plaintiff,

vs.

THE TENNESSEE COPPER COMPANY AND THE DUCKTOWN SULPHUR, COPPER & IRON COMPANY (LIMITED),
Defendants.

IN EQUITY.

ORIGINAL BILL OF COMPLAINT.

THE STATE OF GEORGIA,
BY
JOHN C. HART, ATTORNEY-GENERAL OF GEORGIA,
LIGON JOHNSON,
OF COUNSEL,
ATLANTA, GEORGIA.

ATLANTA, GA.
The Franklin Printing and Publishing Co
Geo. W. Harrison, Manager.
1905.

IN THE SUPREME COURT OF THE UNITED STATES.

October Term, 1905.

THE STATE OF GEORGIA, BY ITS ATTORNEY GENERAL, JOHN C. HART, Plaintiff,		
vs.		In Equity.
THE TENNESSEE COPPER COMPANY AND THE DUCKTOWN SULPHUR, COPPER AND IRON COMPANY (LIMITED), Defendants.		

To the Honorable, The Chief Justice and Associate Justices of the Supreme Court of the United States, sitting in Equity:

Comes the State of Georgia, by its Attorney-General, John C. Hart, and Ligon Johnson, Special Counsel, and leave of the Court being first had and obtained files this, its bill of complaint against the Tennessee Copper Company, a corporation organized and existing under the laws of the State of New Jersey, but a resident of the State of Tennessee, with its main office in Polk county, said State; and the Ducktown Sulphur, Copper and Iron Company (Limited), a corporation of Great Britain, but a denizen of, and having its principal office in Polk county, Tennessee.

And whereupon, your orator complains and says:

First.

Your orator, the State of Georgia, is one of the original thirteen States of the American Union, and a sovereign State of the United States.

The defendant, The Tennessee Copper Company, is a corporation chartered under the laws of the State of New Jersey, for the purpose of mining, manufacturing and producing copper and sulphur ores and products in Polk county, Tennessee, with its main office in said last-named county and State.

The defendant, The Ducktown Sulphur, Copper and Iron Company (Limited), is a corporation created and organized under the laws of Great Britain for the purpose of mining, manufacturing and producing copper, sulphur and iron ores and products in Polk county, Tennessee, with its main office in said State and county, and, under and by virtue of the laws of the State of Tennessee, through filing a duly certified copy of its charter with the Secretary of State, and being authorized to locate and carry on its business in said State, and so locating and carrying on same, became and is a denizen of the State of Tennessee.

Second.

Your orator by virtue of its sovereignty is the original and ultimate proprietor and owner of all lands within its jurisdiction, including those in the counties of Murray, Gilmer, Fannin, Union and Towns, from which last named it derives a considerable portion of its income and public revenue; and is the owner in fee of all public highways and roads within the State of Georgia, or has a direct property right therein and the control and protection thereof, particularly with reference to those in the hereinbefore named counties, which your orator at great expense has caused to be laid out and maintained.

Third.

Your orator, as a sovereign State, guarantees under its Constitution and the bill of rights thereof to each and every of its citizens and inhabitants the impartial and complete protection to person and property within its confines, including its citizens, inhabitants and property in the counties of Murray, Gilmer, Fannin, Union and Towns aforesaid.

Fourth.

The defendants, the Tennessee Copper Company and the Ducktown Sulphur, Copper and Iron Company (Limited), are now and have been for some time prior to the filing of this bill engaged in the mining, roasting, reducing, smelting, manufacture and production of sulphur and copper ores and products in Polk county, Tennessee, and but a short distance from the dividing line between said State and your orator.

Said defendants in the development and conduct of said business, have each recently erected, or caused to be constructed, and now own, operate, manage and control a number of furnaces, smelters, ovens, and roasting and reduction appliances in value many times in excess of two thousand dollars, each of said defendants well knowing before said construction was begun, or appliances installed, that the use or operation thereof would work both a public and private nuisance, and result in irreparable injury to your orator and her citizens.

Fifth.

That by means of and through said furnaces, smelter, ovens and appliances said defendants are constantly generating and causing to be discharged over the territory of your orator, particularly upon the lands and its roads and highways within the counties of Murray, Gilmer, Fannin, Union and Towns aforesaid, for a radius of fifty miles or more from said Ducktown, Tennessee, and the nearest point thereto on the Georgia line, vast quantities of smoke, sulphur fumes, and noxious and poisonous vapors and gases, thereby causing and creating both a public and a private nuisance by rendering the atmosphere dense, dark, impure, unwholesome and unpleasant, and depriving your orator, its citizens and inhabitants of sunlight and pure air, to the irreparable injury of your orator and its inhabitants.

Sixth.

That said smoke, fumes, and noxious and poisonous gases and

vapors generated by defendants and diffused over the territory of your orator, its lands, roads and highways, intermingle and commingle with each other and blend together, both in the State of Tennessee before being diffused, as aforesaid, and afterwards, and so infused, blended and joined together, jointly create said nuisance and inflict irreparable damage, hereinbefore and hereinafter more fully complained of.

Seventh.

That said noxious smoke, fumes, gases and vapors have destroyed over a considerable portion of your orator's territory within the counties aforesaid all vegetables, crops, grasses, orchards, fruit trees, forest and other vegetation and timber, of the value of hundreds of thousands dollars, the zone of destruction growing under each month of the operation of said works, to the irreparable injury of your orator, its lands, highways and income.

Eighth.

That by the destruction of said trees and vegetation the accumulation of moisture necessary to sustain plant life and to supply the mountain reservoirs, springs, streams and rivers is prevented, there being nothing to collect or retain the moisture, dew or rain precipitated within said territory, no water being absorbed as by nature intended and demanded, but on the contrary, the same runs off as rapidly as discharged upon such barren soil, to the further and irreparable injury of your orator.

Ninth.

By reason of the des ruction of the timber and vegetation and the condition caused thereby, preventing tne absorption of moisture, rain and water discharged or precipitated within said locality, severe freshets and floods are occasioned, and the top or fertile soil capable of producing vegetables, crops, fruits, trees, forests and other vegetation is beginning to be washed

away, leaving only a subsoil of decomposing rocks, quartz and mica, incapable of producing or nurturing plant life; and unless remedied by permitting the necessary plants and vegetation to spring up before the total destruction of such top soil the area affected by such smoke, fumes and gases will become a barren waste subject to sudden, severe and dangerous floods and freshets, resulting in many thousands of dollars additional damage, to the irreparable injury of your oratory and its citizens.

Tenth.

By the washing of said soil not only the regions from which said soil is carried, but the fertility of the lower and outlying valleys is now, and in the future will be still more seriously menaced and affected if not destroyed, the said top soil carrying with it the decomposing rock, mica and quartz, and precipitating them upon the lower valleys, thereby destroying the productiveness of such valley lands, to the irreparable injury of your orator and its citizens.

Eleventh.

That, by the destruction of the timber aforesaid, through dead forests, trees and vegetation, not only the passage over, but safety and convenience of your orator's highways are menaced and impaired; by the freshets and floods, and the washing of the soil and levees, and the gullies, holes and ruts, and other injuries occasioned thereby, your orator's roads and highways are greatly damaged and rendered unsafe, dangerous and inconvenient, which injury, damage and inconvenience will constantly increase with the continuance of the cause aforesaid; by the noisome and disagreeable smoke, vapors, fumes and gases hereinbefore set forth, said highways are rendered unhealthful, uncomfortable, unpleasant, undesirable and unsatisfactory for travel and commerce, said highways being practically the sole means of communication and inter and intrastate commerce in said locality, to the further and irreparable injury to your orator.

Twelfth.

By the said injury to the soil and highways, and to the forests, orchards, gardens and crops, as well as the convenience, comfort and safety of the citizens, owners and inhabitants of said territory, the value of the lands in said counties of Murray, Gilmer, Fannin, Union and Towns has been greatly impaired and in the locality immediately affected by said smoke, fumes and gases, to wit: Within a radius of fifty miles or more from the nearest point on the Georgia line, the same being in Fannin county, about one and one-half miles south of Ducktown, Tenn., the values of lands have been decreased hundreds of thousands of dollars and will further decrease with the continuance of said works and nuisance, to the irreparable injury of your orator, and her citizens.

Thirteenth.

By said damage to the soil and highways, the forests, gardens and crops, and to the comfort, convenience and safety of the citizens, owners and inhabitants, not only has the value of all lands affected by said smoke and gases been greatly decreased, but the income and public revenue of your orator from said counties have been seriously interfered with and lessened, far more than the jurisdictional amount for this honorable court herein, and will further decrease with the continuance of said cause of injury, to wit, said nuisance heretofore complained of to the irreparable injury of your orator.

Fourteenth.

By said poisonous smoke and gases the atmosphere over and upon said territory of your orator has been, and is now rendered noisome, foul, unwholesome and difficult to breathe, and the health of your orator's citizens and inhabitants in said locality has been, and unless said nuisance is at once abated will be still further, seriously injured and impaired, their vitality lessened, their susceptibility to all diseases greatly increased.

The destruction of crops, grasses, orchards, trees and forests, and the washing and injury to the soil, have deprived the citizens of your orator of their means of livelihood by farming, fruit growing, lumbering and stock raising, and other industries to which said locality was adapted; and said noisome and noxious gases, fumes, smoke and vapors have further deprived them of pure air and sunlight and the peaceable and comfortable enjoyment of their homes and property, the radius of which injury will increase with the continued operation of said defendants, to the irreparable injury of your orator and its citizens.

Fifteenth.

That during the year 1903 citizens of the counties of Murray, Gilmer, Fannin, Union and Towns appealed to your orator for protection from the injuries being wrought by the defendants as aforesaid, and whereupon the Legislature of the State of Georgia enacted a resolution, approved August 17, 1903, as follows:

> "WHEREAS, It has been represented that great and irreparable damage has been, and is being, done to the timber, fruits and agricultural interests in the counties of Murray, Gilmer, Fannin, Union and Towns, in the northern part of the State, through and by the smoke and fumes produced by the smelting of copper ores at the copper mines in Ducktown vicinity, in Polk county, State of Tennessee; and
>
> "WHEREAS, Some steps should be taken looking towards the suppression of this evil; therefore, be it
>
> "*Resolved*, by the General Assembly of the State of Georgia, That a commission composed of five members, three of whom shall be made up as follows: The Commissioner of Agriculture, State Chemist, State Geologist, and two private citizens, to be named by the Governor of this State, in the locality affected, whose duty it shall be to examine into the facts herein referred to, and that in reasonable time report to the

Governor of said State fully as to the damage already done and the damage likely to be done, and such other suggestions as they may deem proper to make in the premises, and that the Governor on receiving said report be authorized, as in his judgment, to take such steps as shall be deemed proper and necessary to correct this evil, and to prevent further damage."

Sixteenth.

That in accordance with said resolution, your orator through its Governor appointed a commission of five of its citizens, including its Commissioner of Agriculture, State Chemist, and Geologist. to make an investigation of the damage, if any, being done within the territory of your orator by the fumes, smoke, gases and vapors generated or occasioned by defendants; which committee on the 20th day of November, 1903, made a report of such damages, which report is hereto attached, marked Exhibit "A," and to which reference is prayed.

Your orator further directed the State Entomologist, an expert in the science of plant life, and the disease and causes leading to the disease and death thereof, to make a thorough investigation and report to your orator through its Governor the condition of vegetation, plants, trees, and the like within the locality hereinbefore referred to, and on the 28th day of October, 1903, Wilmon Newell, Entomologist, as aforesaid, reported to your orator the great destruction of said plants, grasses, vegetation, orchards, trees and forests by the poisonous smoke and gases of defendants, and that further damage would result by the continued operations of defendants; which report is hereto attached, marked Exhibit "B," and made a part hereof, and to which reference is prayed.

Seventeenth.

Your orator, upon the receipt of the report of its committee and its Entomologist, communicated same to the State of Tennessee, through its Governor and Attorney-General, in which

State said works were located, praying said State to abate said nuisance and cease and prevent further injury to your orator and its citizens through the causes hereinbefore complained of, a copy of which communication is hereto attached, marked Exhibit "C," to which reference is prayed.

Eighteenth.

On the 14th day of December, 1903, the State of Tennessee, by communication from its Governor, the same being hereto attached and marked Exhibit "D," and to which reference is prayed, declined to abate said nuisance or restrain its citizens or inhabitants in said irreparable injury to your orator and its citizens, and whereupon Hon. J. M. Terrell, Governor of Georgia, passed an executive order, directing suit be filed, and in accordance therewith suit was instituted to the October Term, 1903, of the Honorable Court.

Nineteenth.

Shortly after the complaint to the Legislature of your orator as hereinbefore set forth, the defendant, the Ducktown Sulphur, Copper and Iron Company, abandoned open heap roasting, the process of reducing ores in use when said complaints first arose, and during the pendency of said suit an agreement was proffered to the effect that in consideration of the agreement by the State of Georgia to dismiss the pending suit, the defendant, The Tennessee Copper Company, would covenant to also abandon the open heap process, and that each and both of said defendants would agree to forever abandon and never to return to said mode of roasting or reducing ores, said open heap method being then deemed both by the commission of the State of Georgia hereinbefore referred to as well as the defendants to be the true cause of the existing injuries and nuisance, which agreement was duly entered into, said open heap process abandoned and said suit dismissed, a copy of which agreement is hereto attached and marked Exhibit "E," for identification.

Twentieth.

Upon the abandonment of the said open heap process of roasting their said ores the said defendants constructed and instituted a new process operated through the means of furnaces, kilns and other reduction appliances which resulted in concentrating and making many times more powerful the said noxious gases, fumes, smoke and vapors, and instead of remedying or lessening the said evils and nuisance theretofore sought to be abated, the said new method, while more profitable and commercially more satisfactory to defendants, greatly aggravated and increased the damages and multiplied the injuries theretofore done and being done by the defendants, as well as extended the territory subject to the pernicious and ruinous influences of said fumes.

Twenty-first.

In addition to the increase of damage and injury from the causes as in paragraph twenty set out, the defendant, The Tennessee Copper Company, removed its roasting and reducing plant from a point several miles within the State of Tennessee to a location only about a quarter of a mile from the Georgia line, so that its fumes and vapors in addition to being generated and given forth in greatly concentrated form, are diffused over and upon the territory, lands and highways of your orator without even the former leavening influence of the intervening atmosphere within the State of Tennessee.

Twenty-second.

As hereinbefore set forth, under the capacity of the furnaces as operated since the introduction of the new method, and up to and through the summer of 1905, the damage done and being done to your orator by defendants was enormously increased and if allowed to continue the injuries will more than treble those previously existing and threatened under the old method of operating said copper plants.

The defendant, The Tennessee Copper Company, is, in addition engaged in erecting new furnaces and appliances, increasing its said plant and more than doubling its present capacity, there being now but three furnaces built and in operation, but said defendant has four further furnaces in course of construction and which will soon be finished and ready for operation. Said Tennessee Copper Company threatens to begin the use and operation of said furnaces as soon as same are completed.

The new furnaces will have a capacity about equal to the total present capacity of the works of both of defendants herein and should said new furnaces be permitted to operate, the poisonous and noxious smoke, fumes, gases and vapors generated thereby would result in not only doubling in quantity and strength those heretofore complained of, but would multiply the power for injury, vastly increase the territory subject thereto and more than double each and all of the damages done and being done and the injuries threatened your orator and her citizens, as hereinbefore complained of, to the irreparable injury of your orator and her citizens.

Twenty-third.

Shortly after the installation of said new mode of roasting or reducing said ores, your orator was informed that the damage from said fumes and gases instead of ceasing was steadily increasing and whereupon your orator requested an investigation and report by the Bureau of Forestry of the United States in order to ascertain as nearly as could be, the conditions then existing. During the early part of the present year said investigation was duly made and report furnished and in which investigation it was developed and in said report set forth that the new method of roasting or reducing ores then and now in vogue at defendant's plants had not diminished but had greatly increased both the injury and scope of territory liable thereto, said report declaring "the tall chimneys now in use at the copper works were erected with the idea of abating the smoke nuisance. It seems, however, they tend to spread the fumes over a wider area and thus increase the damage

done to the timber lands. The old method of open heaps has already destroyed all vegetation in the immediate neighborhood; the new method will extend the damage."

A copy of said report is hereto attached, marked Exhibit F and made a part hereof.

Twenty-fourth.

The citizens of your orator within the locality affected by said fume and gases again addressed a memorial to the legislature of the State of Georgia setting forth the menace to life, health and property of the citizens of your orator by said defendants and on the 15th day of August, 1905, a resolution was enacted by the legislature and approved by the Governor providing for a second commission to investigate and report the damage if any being done the State of Georgia and her citizens by the defendants herein and to remedy the same if damage was found to exist, which resolution was as follows, to wit:

> "WHEREAS the General Assembly on August 17th, 1903, provided for a commission to investigate the damage being done by the copper reduction works at and near Ducktown, Tennessee, to the fruit, agriculture and timber interests in certain counties in this State, and in pursuance thereof the commission reported that great damage was being done the territory in Georgia contiguous to the Ducktown district, said damage being caused by the smoke, sulphur fumes and noxious and poisonous fumes and gases generated by the roast heaps, pits, ovens and appliances of the Ducktown copper companies, and
>
> WHEREAS, the Governor under the authority in him vested by said act caused to be instituted a suit in the Supreme Court of the United States to abate the nuisance and injury by restraining and enjoining such methods of roasting and reducing the copper ores, and
>
> WHEREAS, pending the suit the Ducktown copper companies agreed to abandon that method of treating

the ores and to institute a new method which it was hoped and believed would entirely remove the offensive gases and in pursuance of that agreement the State of Georgia dismissed its said suit and the copper companies abandoned the method complained of and have since instituted a new process, which new process it is reported as injurious to all manner of vegetation as the former method; therefore, be it

Resolved, by the Senate, the House concurring, that a commission be appointed consisting of the Commissioner of Agriculture, State Chemist, State Geologist, Will H. Shippen and Judge J. R. Chastain, and they are hereby authorized and directed to investigate the present condition and report the same to the Governor as soon as possible, and that the Governor be and he is hereby authorized and directed to take such steps as he may deem advisable and appropriate in conformity of the commission to correct and prevent further injury and that the Attorney-General be and he is hereby instructed to take such legal steps as may be necessary to abate the nuisance if found to exist."

Twenty-fifth.

Said commission, in accordance with the terms of said resolution, made a thorough examination and investigation, and on August 30th, 1905, rendered its report to the Governor of Georgia, in which it was reported to your orator and said commission declared:

"We found conditions alarming in the extreme and we have not words at our command to impress on your excellency the instant, urgent and imperative need of immediate action for relief, if that past of our State is to be saved to its present owners and our commonwealth . . . It is our unanimous opinion that the new process as adopted by The Tennessee Copper Company is proving and has proven far more injurious to vegetation, fruit, farming and the timber interest of our State than the old process ever was."

Said commission further recommended and urged that immediate legal proceedings be instituted to abate said nuisance and prevent further damage being occasioned thereby. A copy of the report of said commission is hereto attached, marked Exhibit G and made a part thereof and to which reference is prayed.

Twenty-sixth.

Upon receipt of said report, Honorable Joseph M. Terrell Governor of Georgia, pursuant to the general authority in him vested and under the terms of the resolution hereinbefore set out on the 21st day of September, 1905, passed an executive order, a copy whereof is hereto attached and marked Exhibit H for identification, directing suit be filed, and in accordance therewith and under the further authority in the Attorney General by said resolution vested, this suit is herewith brought.

Twenty-seventh.

The defendants being foreign citizens and non-residents of the State of Georgia and not within its confines and the acts complained of being committed without the jurisdiction of your orator and said defendants being not liable to indictment by your orator for said public nuisance and injury to your orator and its citizens, but beyond its power and control; and, as your orator is forbidden by the Constitution of the United States from any invasion, aggressive operation or other direct action in the premises and all diplomatic and amicable negotiations have failed and friendly efforts been exhausted, your orator within itself and without the aid of this Honorable Court is powerless in the premises.

In consideration whereof and for as much as your orator is remediless in the premises, and can have no adequate relief except in this court; and to the end, therefore, that the defendants may, if they can, show why your orator should not have the relief prayed, and to the end that the defendants may make full, true, direct and perfect answer to the matters hereinbefore sta-

ted and charged, but not under oath, answer under oath being expressly waived, and to the end that the defendants and each of them, their officers, servants and employees may be restrained by injunction issuing out of this Court from doing, causing, directing or in any manner aiding or abetting the acts hereinbefore complained of, or their continuance; and your orator prays that your Honors may grant a writ of injunction properly restraining and enjoining the defendants and each of them, their officers, agents, servants and employees from maintaining, operating, or directing or permitting upon their land or premises the operation or maintenance of any oven, roast heap, pit, furnace or appliance, generating or giving forth any of the smoke, gases, fumes or vapors hereinbefore complained of, or otherwise generating, producing or causing any foul or dense or copper or sulphurous smoke, or any noxious, poisonous, unhealthy or disagreeable, or in any manner, injurious vapor, gas, fume or odor, or from the liberation or diffusion of any such foul or dense smoke or noxious, poisonous, unhealthy or unpleasant, or in any manner injurious gas, vapor, fume or odor upon the territory or lands of your orator and its citizens, or upon its roads or highways.

Your orator further prays that your Honors grant unto your orator a writ of injunction commanding the said defendants, The Ducktown Sulphur, Copper and Iron Company (Limited) and the Tennessee Copper Company, and each of them, their agents, servants, employees and confederates, and all persons acting under their authority, direction or control, or under the direction, authority or control of either of them, to absolutely desist and refrain from using, managing, maintaining or in any manner operating any furnace pit, oven or other appliance or copper reducing method, causing, generating, giving off or discharging any foul or dense smoke, or any poisonous, noxious unwholesome or unpleasant gas, vapor, odor or fume, and from the diffusing of any foul or dense smoke, or poisoning, noxious, unwholesome or unpleasant gas, vapor, odor or fume, upon the territory or lands of your orator and its citizens, or its roads and highways, or from the generating, causing or diffusing any foul or dense smoke or any gas, vapor, odor or fume damaging, de-

stroying or injuring the property of your orator or its citizens, or causing or producing any physical or bodily harm, injury, discomfort or inconvenience to the citizens of your orator, or depriving your orator or its citizens and inhabitants of pure air and sunlight, until such time as your Honors shall direct herein; and that upon the hearing hereof the writ herein prayed for be made and confirmed until the final determination of this suit, and that thereupon the said injunction be made perpetual.

Your orator further prays that, pending the hearing of this cause, a temporary injunction and restraining order be granted, prohibiting the defendant, the Tennessee Copper Company, from in anywise operating, firing or using said four furnaces newly erected or in course of erection hereinbefore referred to or any of them for the purpose of roasting, smelting or reducing copper or sulphurous ores, and from generating, liberating or in any manner causing to be discharged by, through or in connection with said furnaces or any of them any smoke, gas fumes or vapor as hereinbefore complained of, and that upon the final hearing hereof said injunction be made permanent.

Your orator further prays for such other and further relief herein as may to the court seem meet and proper.

May it please your Honors to grant unto your orator, not only a writ of injunction conformable with the prayer of this bill, but a writ of subpoena issuing out of and under the seal of this Honorable Court directed to the defendants, The Tennessee Copper Company and The Ducktown Sulphur, Copper and Iron Company (Limited), their officers, trustees and agents, commanding them and each of them, under a certain penalty to be therein inserted, on a day certain to be and appear and answer (but not under oath) to this bill or complaint, and to further stand to and abide such order and decree as shall be made here agreeable to equity and good conscience, and your orator will ever pray.

THE STATE OF GEORGIA.
by JOHN C. HART,
Attorney General of Georgia.

LIGON JOHNSON,
Special Counsel.

UNITED STATES OF AMERICA,
STATE OF GEORGIA,
COUNTY OF FULTON.

Personally appeared before me, the undersigned authority, Joseph M. Terrell, who being sworn in the foregoing cause on oath says that he is the Governor of the State of Georgia, and as such requested and directed the filing of said bill therein; that the facts therein stated as to his acts as Governor are, of his own knowledge, true, and the remaining facts therein stated he is informed and believe to be true. J. M. TERRELL.

Sworn to and subscribed before me this 4th day of October, 1905.

[SEAL] W. H. HARRISON,
Notary Public, Fulton County, Ga.

"EXHIBIT" A.

ATLANTA, GA., November 20, 1903.

To His Excellency, J. M. Terrell, Governor of Georgia.

Sir: The undersigned commission acting under and by authority of a joint resolution, assented to by the General Assembly of this State at its present session, and approved by your Excellency, providing for the appointment of a commission to enquire into and report to you the damage done and being done to vegetation, fruit, timber and other interests in the counties of Murray, Gilmer, Fannin, Union and Towns of this State by reason of the smoke and fumes from the copper mines located at Ducktown, in the State of Tennessee, respectfully report as follows:

Ducktown, Tenn., is a copper mining and refining camp, in the southeast corner of said State, just across the State line, between Georgia and Tennessee. Here copper mining and copper refining is being carried on in an extensive manner.

After a personal examination of the section of the country in the State of Georgia adjacent to Ducktown, and after considering the report made by Mr. W. Newell, State Entomologist, thereon, we are convinced that the copper reduction works as at present conducted at Ducktown constitute not only a nuisance, but have been, and are hourly, daily damaging and destroying vegetable life for a very considerable distance away from their location, and for miles within the boundaries of this State. So much so, that this damage is incalculable. If said works are to be continued, a large area of farming and timber country within the limits of the State will certainly be totally destroyed and lost to the present owners.

Wherefore, we conclude that if the parties now operating said mine and copper reduction works will not, after proper notice, abate the nuisance by employing all the known means for doing so, then the power of the law, both State and National, should be invoked to force them to do so.

In our opinion, it being better that this industry should be entirely annihilated than that the present intolerable condition should continue.

Wherefore, we respectfully recommend your Excellency through the Attorney-General, and in the name of the State, to begin proper legal proceedings to abate said nuisance and to arrest the damage now being done to the property of the citizens of this State.

Respectfully submitted,

O. B. Stevens,
Jno. M. McCandless,
W. E. Candler,
J. H. Witzel,
W. S. Yeates.

EXHIBIT "B."

ATLANTA, GA., October 28, 1903.

To His Excellency, Governor J. M. Terrell, Atlanta, Ga.

DEAR SIR: In accordance with your instructions I visited the northern portion of Fannin county, Georgia, upon the 26th and 27th instants, for the purpose of investigating the death of forest trees and other vegetation in that section. The trip was made from Blue Ridge, Georgia, to Mineral Bluff, Georgia, and hence to Isabella and Ducktown, Tennessee, in company with Hon. J. H. Witzel, a member of the Commission appointed by you for this investigation, and by Messrs. J. W. Anderson, A. B. Dickey and J. Wilson, landowners near Mineral Bluff, Georgia.

Upon the result of this investigation, I beg to report as follows:

That Ducktown, Tennessee, is a copper-mining and refining camp where ore is roasted under open sheds, the smoke therefrom containing a large percentage of sulphurous acid.

That this sulphurous acid has removed from the country, within a radius of two miles, all traces of vegetation, save an occasional patch of Bermuda grass, and that all forest trees within four miles of the refinery are destroyed and the earth devoid of practically all vegetation except broom-sedge.

That at a distance of from five to six miles 50 to 75 per cent. of all timber is dead, and that the effects of the sulphurous acid smoke are plainly noticeable at points ten to twelve miles from the refinery.

That the area of devastation is steadily increasing there can be no doubt, and that the sulphurous acid from the copper refinery is the destructive agent is self-evident.

Owing to the lateness of the season and the fact that several severe frosts have occurred in this region, our observations were necessarily confined to the forest and cultivated trees. The effect upon growing crops could not, of course, be determined,

but, judging from the effect upon forest growth, destruction to growing crops must amount to ruin. This is evidenced by the fact that in the area already denuded of forest growth no attempt is made to grow crops. This denuded area is in fact totally abandoned except by the employees of the copper-mining companies.

Examinations made at distances varying from four to ten miles from Ducktown show that the white, red and black and post oaks, hickory, peach, apple and walnut are the trees which first succumb to the poisonous gases. Long-leaf pine, and especially poles and saplings of this species, appear to be most resistant.

The theory has been advanced that insects or diseases have destroyed this timber. I find nothing to support this theory. In the investigation trees of various kinds were cut down and examined for indications of insect work. In timber which has been dead for a considerable time, insects are abundant, but they are of species which feed upon *dead* vegetable matter and therefore are not responsible for the death of the trees. Were insects responsible for this destruction they should be found in timber now dying, or but recently dead. Our examinations failed to reveal them except in rare cases. Possibly the death of one tree out of every five hundred dead is chargeable directly or indirectly to insect work. This amount of insect damage is comparatively insignificant and is no more than can be reasonably expected to occur in any forest locality.

Again, trees killed by insect pests present certain characteristics which in the present case are conspicuously absent. Practically all trees can withstand and do withstand for a considerable time the ravages of insects before finally dying. This results in such trees throwing out what are termed water sprouts or suckers from the base of the trunk or from the roots. In the case of the dying and dead trees in the Ducktown locality we find no suckers, but, instead, that root, trunk and branches are killed at almost the same time. The cambium (the layer of the cell-forming tissue immediately beneath the bark) in trees killed by the sulphur fumes becomes blackened even before the tree

has succumbed to the poison. This character we fail to find in trees dying from the attacks of insects or from any other cause reducing their vitality.

The fact that certain trees in the affected locality die while trees adjacent remain apparently healthy does not necessarily indicate that the sulphurous acid smoke is not the destructive agent. The power of resistance when exposed to unfavorable conditions varies with different species, and may reasonably be supposed to vary in individual plants of the same species.

This power of resistance is in all probability directly proportionate to the vitality of the individual plant. Young trees or those most favorably situated with reference to moisture, soil, etc., may be expected to longer withstand the sulphur fumes than others. That the resistance power in plants *does* vary in individuals of the same species, even when grown and kept under the same conditions, has been shown in the fumigation of nursery stock when by mistake the latter have been subjected to too strong a dose of hydrocyanic acid gas. Some trees will be killed while others of the same lot, when planted, grow well and show no indication of injury.

The roots of various dying trees in the affected area were examined and no indication found of fungous diseases.

In brief, many square miles are being denuded of all forest growth and the devastation can be traced to no other agency than the sulphur fumes from the copper refineries at Ducktown and Isabella, Tenn.

Within a radius of ten miles (in Georgia territory at least) all merchantable timber, i. e., timber, suitable for lumber, has already been destroyed and a continuance of present conditions will within a few years convert this territory into a barren desert.

The preservation of the forests even upon limited areas is a matter of moment, not only to the inhabitants of the immediate locality, but to the State at large. Removal of the forest means rapid soil erosion and makes the land utterly worthless for agriculture. Forest, even of young growth, tend to consume moisture and prevent floods, while their absence conduces to extremes of flood and drouth.

The forest land supplied the people with wood, one of the prime necessities, and as much forest land as possible should be protected against all ravages, that future generations may be supplied with wood, lumber and arable land.

The reclamation of the area already devastated by these sulphur fumes is possible only by reforestation, which under present conditions is impossible. Even were the smoke nuisance at once abated, reforestation would require years of time. In our opinion the forest interests of Fannin county, Georgia, are of far more value and importance to the commonwealth than any revenue to be derived, directly or indirectly, from copper mining and refining.

Two mining companies, The Ducktown Sulphur, Copper & Iron Co., and the Tennessee Copper & Iron Co., are responsible for the wide-spread destruction of timber and agricultural interests. Of these two the latter is at present doing far more damage than the former, as by roasting their ore in open sheds they turn loose enormous volumns of sulphurous acid smoke which cover the surrounding country. The Ducktown Sulphur, Copper & Iron Co. has abandoned entirely the roasting process and smelts the ore without roasting, thus demonstrating that the roasting sheds and their poisonous smoke at least can be dispensed with and the works still operated at a profit.

In behalf of the farming interests of Fannin county, Georgia, and in behalf of the commonwealth at large, I would most urgently call to your attention the necessity of immediate steps looking to the removal or abatement of this nuisance.

Respectfully submitted.

WILMON NEWELL,
State Entomologist.

EXHIBIT "C."

November, ——, 1903.

Governor J. B. Frazier, Nashville, Tenn.

DEAR SIR: In pursuance of a resolution passed by the Georgia Legislature and approved August 17, 1903, I appointed a commission to report on the damage done in Georgia by the smelting of copper at Ducktown, Polk county, Tennessee. The reason which led up to the passage of this resolution by the Legislature was a complaint by the citizens of Murray, Gilmer, Union and Towns counties, in this State, that the timber, fruits and agricultural interests in these counties had suffered great and irreparable damage on account of fumes produced by the smelting of copper ore at said copper mines. I herewith submit for your consideration the report of the commission appointed.

The State of Georgia has become interested in the question because of the great damage done to a large area of public domain and a threatened total destruction of all vegetation within thirty or forty miles of these works. The report makes an alarming state of affairs, and as Governor of Georgia I conceive it my duty in pursuance of said resolution to call your attention thereto, and to request of you as Governor of Tennessee to take steps to prevent a continuation of the methods used for smelting ores by these corporations, which corporations, I understand, are created by the laws of Tennessee.

Very respectfully,

(Signed) J. M. TERRELL, Governor.

EXHIBIT "D."

EXECUTIVE DEPARTMENT, STATE OF TENNESSEE,
NASHVILLE, December 14, 1903.

Hon. J. M. Terrell, Governor of Georgia, Atlanta.

MY DEAR GOVERNOR: Your letter of recent date enclosing me a report of commissioners appointed by the Legislature of Georgia to investigate the alleged damage done to property of citizens of Georgia by the sulphur fumes arising from the copper mines at Ducktown, Tennessee, received.

I, of course, regret it if in the operation of any industry in Tennessee a citizen or citizens of a neighboring State should be injured in their persons or property, but conceding that the operation of these works do damage the property of the citizens of Georgia, I know of no power vested in me as Governor of Tennessee to interfere and prevent such injury. If the citizens of Georgia are injured by the operation of these works by their owners, either in their person or their property, the courts of Tennessee and possibly of the United States are the only tribunals that I know of in which redress can be sought.

From the information obtained from Ducktown, the extent of the injury done by the operation of these industries has been very greatly exaggerated, but as to this I express no opinion. I know that the persons operating these mines are careful and successful business men, and that they have made expensive experiments, and are still doing so, with the view of devising some means by which the copper ores can be reduced and smelted without emitting the sulphurous smoke about which complaint has been made. As to what success they have achieved I am not informed.

The operation of great and growing industries, such as these Tennessee Copper Mines, necessarily carries with it some inconveniences and possibly injury to those situated near to the works, as well as the numerous advantages which they bring. I am informed that the lands both in Tennessee and in Georgia, lying near to these works, would in the absence of the copper mines, not be of very great value, and that the operation of the mines

affords work at remunerative wages to a large number of people living in that vicinity. If any citizens of Georgia are being injured by the operation of these industries, I very greatly regret it, but, as indicated above, I know of no power vested in me to interfere in this matter.

With assurance of my highest personal esteem, I have the honor to remain Very respectfully,

(Signed) JAMES B. FRAZIER.

EXHIBIT E.

IN THE SUPREME COURT OF THE UNITED STATES,
OCTOBER TERM, 1903.

THE STATE OF GEORGIA
vs.
THE DUCKTOWN SULPHUR, COPPER & IRON CO., THE TENNESSEE COPPER CO., AND THE PITTSBURG & TENNESSEE COPPER CO., Defendants.
} In Equity.

Come the parties, plaintiff and defendants, in the above entitled cause and move the court that the attached and following agreement and stipulation for settlement be filed herein and proper order taken thereunder.

THE DUCKTOWN SULPHUR, COPPER & IRON CO. (LTD.),
By JAS. G. PARKS, of Counsel.
THE PITTSBURG & TENNESSEE COPPER CO.,
THE TENNESSEE COPPER CO.,
By HOWARD CORNICK, of Counsel.
THE STATE OF GEORGIA,
By JOHN C. HART, Attorney-General.
LIGON JOHNSON, Special Attorney of Counsel.

IN THE SUPREME COURT OF THE UNITED STATES,
OCTOBER TERM, 1903.

THE STATE OF GEORGIA
vs.
THE DUCKTOWN SULPHUR, COPPER & IRON CO., THE TENNESSEE COPPER CO., AND THE PITTSBURG & TENNESSEE COPPER CO., Defendants.
} In Equity.

WHEREAS, The State of Georgia filed its bill in equity against the above named defendants on the day of 1904, in the Supreme Court of the United States, which suit is now pending, in which bill of complaint it is alleged by the State of

Georgia that her public domain is injured by the defendant copper companies above named, by certain sulphurous smoke, fumes and gases originated by the defendants in the operation of their open roast heaps for treating copper and sulphur ores; and,

WHEREAS, At the time said suit was filed The Ducktown Sulphur, Copper & Iron Company (Limited) and the Pittsburg & Tennessee Copper Company was no longer roasting their ores in the open beds or roast heaps producing the alleged dense smoke and attendant fumes and gases complained of; and,

WHEREAS, The Tennessee Copper Company since the filing of the bill in this cause has abandoned the roasting process and has lighted its last roast heap, and that each and all of said companies have heretofore and by this agreement declared that after the present ignited heaps have burned out neither of them will again return to said method of roasting their ores, of which method the State of Georgia especially complained:

It is therefore agreed between the State of Georgia and the defendants in consideration of this stipulation on the part of said companies not to return to said method of roasting their said ores, that an order shall be entered specifying that said bill shall be dismissed.

It is further agreed that this stipulation and agreement shall be made a part of and filed in said case and an order of dismissal issued in accordance therewith.

It is further stipulated that the dismissal of said suit shall in no wise be construed as an adjudication of any of the questions involved therein and that it shall not operate to the prejudice of the rights of either or any of the parties beyond the terms of this agreement.

THE TENNESSEE COPPER COMPANY,
BY HOWARD CORNICK, of Counsel.
THE PITTSBURG & TENNESSEE COPPER CO.,
BY HOWARD CORNICK, of Counsel.
THE DUCKTOWN SULPHUR, COPPER & IRON CO. (LTD.),
BY W. H. FREELAND, General Manager.
THE STATE OF GEORGIA,
BY JOHN C. HART, Attorney-General of Georgia.
LIGON JOHNSON, Special Attorney.

EXHIBIT F.

REPORT ON A PRELIMINAY EXAMINATION OF THE EFFECTS OF THE DUCKTOWN SULPHUR FUMES ON THE FORESTS IN POLK COUNTY TENNESSEE.

By Alfred K. Chittenden.
Assistant Forest Inspector, Bureau of Forestry.

This examination was made for the purpose of investigating the death of forest trees in the vicinity of Ducktown, Polk county, Tennessee. Ducktown is a copper-mining and refining center where ore is roasted. The companies operating here are the Ducktown Sulphur, Copper & Iron Company (Ltd.), a British corporation but a resident of the State of Tennessee, and the Pittsburg and Tennessee Copper Company, a corporation organized and existing under the laws of Tennessee.

The copper ore was formerly roasted under open sheds, but is now reduced in furnaces at Ducktown and Isabella. The smoke from these furnaces contains a large percentage of sulphur dioxide. This gas, SO_2, striking damp foilage or coming into contact with rain, is changed into sulphurous acid, namely:

$$SO_2 + H_2O = H_2SO_3$$

This acid kills vegetation. It is also possible that this sulphurous acid is oxidized in some measure to sulphuric acid, H_2SO_4. Undoubtedly in this roasting some of the sulphur remains in the matt, but this fact does not greatly concern the present problem except that some of it, i. e. sulphides, may be absorbed and pass into the surface water, and thus be distributed.

The ore roasted contains about 3 per cent of copper, 30 per cent of iron, 30 per cent of sulphur, and various other constituents. Twenty to twenty-five million pounds of copper are produced a year or about two million pounds per month. It can readily be seen what an enormous amount of sulphur is therefore set free.

These companies have been operating since 1891. The whole country around Ducktown was formerly well timbered and the land was capable of producing good crops. At present the country within a radius of two miles is a barren waste, absolutely without vegetation save for scattered and occasional patches of Bermuda grass. Within a radius of three miles all forest trees are destroyed and the principal vegetation is broom sedge. At a distance from the works of from three to five miles over 50 per cent of the standing timber is dead, and such dead trees are common within a radius of twenty miles of Ducktown.

When the ore was roasted, as formerly, under open sheds at the mines, a vast amount of smoke was set free near the ground, and the result was the total destruction of all vegetation in the immediate neighborhood. The ore is now reduced in furnaces with chimneys from 200 to 300 feet in height. The smoke and fumes are thus set free at a higher elevation and in stronger air currents. They are therefore carried to much greater distances before settling. The sulphur fumes can be plainly smelt at a distance of over fifteen miles if the wind is in the right direction. The effect of these tall chimneys is to take the smoke away from Ducktown and to scatter it more extensively over the entire country. Areas that have hitherto remained untouched are now being damaged by the fumes. Timberland owners within thirty miles are deeply concerned. As yet no damages for destruction of standing timber have been paid by these companies.

APPEARANCE OF THE FOREST.

Owing to the fact that the examination was made late in December, when the leaves were off the hardwood trees, it was impossible to determine how many of these trees had been recently killed. The examination was confined to lands in Polk county, Tennessee, in the vicinity of Little Frog Mountain and in the Appalachia district, and as far west as Reliance. This region lies from six to fifteen miles from Ducktown.

The country is rough, mountainous, and much broken up into ridges. The altitude varies from 1,000 to 3,300 feet. It

is typical Southern Appalachian hardwood land with much white and shortleaf pine in mixture. The country may for convenience be divided into coves and slopes. In the coves yellow poplar, white pine, hemlock, beech, white oak, chestnut, birch, linn, hickory, and black and chestnut oaks are the principal species. Practically all the merchantable timber is found in these coves or on the lower slopes. On the slopes chestnut, chestnut oak, shortleaf pine, white and black oaks, and hickories predominate.

In going through the country, in the Little Frog Mountain and Lost Creek sections, from six to twelve miles from Ducktown, the first thing noticed is that a large number of trees are dead. It is to be expected that many of these trees have died of old age, or, especially on the ridges, that they have been broken by the winds, or else, owing to the drying out of the soil by surface fires, many trees have become stagheaded and slowly died off. A few trees also may have been killed by insects, but no insects have been found in timber recently killed. On many of the pines, which could be better studied than the hardwoods at the time the examination was made, the foliage had turned or was turning yellow, and it was evident that the trees would soon die. The fact that certain trees are found dead or dying while neighboring trees remain sound does not necessarily indicate that the trees are not killed by the sulphur fumes. Individual trees may be killed here and there, as the resistance of different species to the fumes must necessarily vary. With trees of the same species, too, many may temporarily escape injury, while adjoining ones are killed outright. Especially after a rain the leaves of one tree, more exposed to the wind than another, may dry off first. If then the fumes settle here, the second tree would be most liable to injury.

The power of resistance, too, probably depends greatly on the vitality of the individual. This would be greatly influenced by soil, moisture, age, and other conditions. Exposure is undoubtedly the most important element. Thus the hickory and chestnut oak, the two most easily injured species, grow on the upper slopes and tops of ridges over which the smoke must nec-

essarily pass. The yellow poplar, which seems to be one of the most resistant species to the fumes, grows only in the coves, and is surrounded often by pine and hemlock. It is therefore more or less protected.

From observations made at the time of this examination, and information given by persons long familiar with the country, the following list of species injured by the fumes has been made, beginning with the most quickly injured trees:

Hickory	White oak
Chestnut oak	Maple
White pine	Red oak
Post oak	Poplar
Chestnut	Beech
Yellow pine	Buckeye
Hemlock	

It is undoubtedly safe to say, judging from the absolute lack of vegetation in the immediate vicinity of Ducktown, that no species of forest tree can resist the smoke if long or constantly exposed to the full fumes. At a distance of ten or twenty miles from the works, however, the fumes must be greatly diffused and their action is therefore necessarily decreased, but nevertheless if long continued the destruction of forest growth seems certain. It is only a few months since the tall chimneys at the reducing works have been in use. It seems certain that they will increase the area of destruction.

The locality damaged depends entirely upon the direction and velocity of the wind. The damage is also greatly increased by rain or heavy dew, as moisture is necessary to change the sulphur dioxide in the smoke to sulphurous acid. The natural moisture in the leaves would probably accomplish this to some extent, but the process is greatly aided by external moisture.

The smoke, blown by the wind, may travel for long distances before settling. It may pass high over the ridges, leaving the trees untouched, or it may drift over their crests, killing the chestnut oak and chestnut, and settle in a cove or pocket beyond, where all the pines will be damaged. Wherever the fumes settle damage is done. It is claimed by the natives that the

fumes will kill trees in a single night, turning the foliage brown and causing it to drop off, thus killing the tree. Whether the fumes will actually kill trees in so short a time could not be determined by this examination.

The conifers—white pine, yellow pine, and hemlock—are easily killed by the fumes. One reason for this may be that they retain their foliage all winter, thus giving a longer period of exposure. In the case of the white pine it is probable also that, extending above the tops of other trees, it is more exposed.

The yellow poplar, the most valuable timber tree in the region, is one of the least easily injured. Whether this is due to natural resistance of the species, or to the fact that it is more or less sheltered in the coves, could not be determined. Seldom at this distance are large bodies of timber found dead, but the trees are killed in small groups or often by single trees. It was, of course, impossible to determine whether single trees had been killed by the sulphur fumes or by some other cause. It is highly improbable, however, that so many trees should be killed by natural causes. The only way to determine this point is by a careful physiological examination of the dead and dying trees.

It is possible also that some of the damage may be due to sunburn. The smoke, when dense, must overhang the foliage very thickly in the morning, and thus the action of the sun is excluded up to the time when the sun's rays (nine or ten o'clock in the morning) become very hot. Then this cloud may be blown away and allow the hot rays of the sun to fall directly upon the foliage more or less moist, the foliage having been protected from the sun by a thick cloud of overhanging vapor up to the time it is carried away. This full and sudden exposure of the foliage to the hot rays of the sun would tend to burn and blister the leaves. This may account for the sudden changing of the leaves in one day.

At a distance of twenty miles from Ducktown, single trees, chiefly white pine on the slopes and chestnut oak and hickory on the ridges, are found dead. It is believed that the number of such trees will increase with the use of the tall chimneys recently erected. These chimneys will tend to scatter the fumes

over a wider territory, and while it will probably be considerable time before all growth is killed at such distances, it will not be long before all merchantable timber, especially white pine, is destroyed.

In addition to the death of timber trees, great damage will be caused by deforestation. Within several miles of the furnaces there is at present no vegetation. The soil is bare and exposed, and, owing to the rough character of the country, these bare slopes are subject to rapid erosion. The land is quickly rendered absolutely worthless once vegetation is destroyed. Deep gullies and slides are formed, water run-off becomes rapid, and great fluctuations must be expected in the streams after every rain. The continuance of present conditions will rapidly increase this barren area.

CONCLUSIONS.

The tall chimneys now in use at the copper works were erected with the idea of abating the smoke nuisance. It seems, however, that they tend to spread the fumes over a wider area, and thus increase the damage done to timberlands. The old method of open roast heaps has already destroyed all vegetation in the immediate neighborhood; the new method will extend the damage.

There is only one way in which the sulphur of the smoke can be gotten rid of, and that is by oxidation to sulphuric acid. Whether this could be made to pay is doubtful, but if the smoke or fumes could be carried off through a large chimney and brought into contact with nitric acid, as in the manufacture of oil or vitriol, it could be oxidized to sulphuric acid, and this concentrated could be transformed into commercial sulphuric acid. The difficulty lies in the fact that the fumes, while very deleterious to vegetation, probably contain only a relatively small proportion of sulphur dioxide.

Timberland owners within the affected area are making every effort to obtain protection from the fumes or satisfaction for the destruction of their timber. Mr. W. H. Shippen, President of Shippen Bros. Lumber Company, Ellijay, Ga., under date of

December 22, 1904, writes as follows: "The situation in many parts here is appalling in the extreme, and certainly merits the action of both Federal and State aid in its suppression. If the matter be not abated shortly, the whole country will be ruined beyond redemption. I have known whole districts here to be blighted in a single night, such as would be occasioned by a heavy hoar frost, and every one in position to know says without exception that the present process is far more destructive than the old ever was."

Several applications have been received by the Bureau of Forestry for assistance in examining into the actual damage done. Among others, Mr. Charles Seymour, acting on behalf of the Oconee Timber Company, and also for the Wetmore and Stevenson property, for which a working plan has been prepared by the Bureau, has applied.

The principal problem to be solved is the actual extent to which the sulphur fumes will damage vegetation and tree growth. While many dead trees are found at a distance of thirty miles from the works, and, owing to the large number of such dead trees, it seems safe to say that they were killed by the sulphur fumes, this can only be actually determined by a careful examination. This final examination should be made by a plant physiologist or chemist. An actual analysis should be made of foliage recently killed at various distances from the works. In this way only can the effects of the fumes on the various species be determined.

It is not thought to be within the province of the Bureau to estimate the amount of timber killed. This is a case for suit against the copper companies by the individual or company owning the timber.

The examination of the effect of the fumes on vegetation should be made in May, with the start of the foliage. It is estimated that this examination would take one trained man about one month. It is estimated that the cost of the field work would be about $75.00.

"EXHIBIT G."

ATLANTA, GA., August 30, 1905.

To His Excellency, J. M. Terrell, Governor of Georgia.

SIR: We, the commission appointed under and acting by authority of a joint resolution of the General Assembly of this State at its last session, and approved by your Excellency, beg to report as follows:

Said resolution provided that this commission promptly investigate the damage done, and now being done to vegetation, timber, fruit and the farming interests of the northern part of this State by the gases, fumes and smoke being generated by the copper plants at and near Isabella, Polk county, Tennessee, and report to your Excellency the conditions found there. Pursuant to the above, this commission did visit the above named section on the 28th and 29th of August and inspected a considerable portion of said territory. We found conditions there alarming in the extreme, and we haven't words at our command to impress on your Excellency the instant, urgent and imperative need of immediate action for relief, if that part of our State is to be saved to its present owners and our commonwealth. The signal destruction to young and old timber and almost all vegetation was appalling in the extreme, and impressed all as we journeyed through the stricken district. From the high ridges, where a view could be gotten of the landscape and surrounding country much of the foliage was brown and seared, and had much the appearance of having been visited by fire or heavy frost, the leaves being more or less brown or seared. In the woods the leaves are falling, or have fallen, and the ground is covered thick with withered and dead leaves, as one would expect to find in late November, did healthy conditions prevail. Many of the crops we found on the land were more or less affected; corn, field peas, potatoes and many hardy weeds showed only too plainly the effects of the action of the fumes. It is our unanimous opinion that the new process as adopted by

the Tennessee Copper Company is proving, and has proven far more injurious to vegetation, fruit, farming and the timber interests of this portion of our State than the old process ever was. This is clearly proven by the timber, much of which put out in full leaf in the spring and this has been killed since. When the open roast heaps were used under the old process, they were located near Ducktown, and the sulphurous gases were largely liberated there. Since the adoption of the new method by the Tennessee Copper Company, they have located their furnaces for the smelting of the green sulphur ores at Isabella, some four miles nearer the territory of this State.

The present furnaces, with their forced draft, and very high heat, drive the fumes and gases from the sulphur ore high into the air, so that the prevailing winds carry and drift them in whichever direction they may be blowing at the time. These concentrated fumes leave the furnace stack in the form of sulphur dioxide, or anhydrous sulphurous oxide. This is carried by the currents of air and the wind to a greater or less distance, according to the velocity of the wind, or the humidity or lightness of the air, and is turned into deadly sulphurous acid, whenever it happens to come into contact with moisture in the air, and is thus precipitated in this form to the earth, settling on the soil and all growing vegetation.

We find the effects of this highly corrosive and dangerous compound on the delicate foliage, and it is burned, blistered and seared as if by extreme heat or heavy frost. As these smelters are now conducted, they are daily and nightly handling hundreds of tons of these ores containing a very high per cent. of sulphur; and as each pound of sulphur burned produces two pounds of sulphur dioxide, it is easy to see the magnitude of this evil that is hourly and daily being turned loose in the surrounding country, to blight and kill all growing crops and vegetation.

It has been satisfactorily proven by the Bureau of Chemistry of the United States Department of Agriculture that one part of sulphur dioxide mixed with one hundred thousand parts of air does great damage to vegetation, and also that one part of sulphur dioxide mixed with one million parts of air seriously

injures vegetation, if it be exposed for any length of time. This has been thoroughly demonstrated by other chemists and biologists, who have worked on the subject, among them being A. Stockhardt and A. Wieler.

The citizens and farmers of the stricken district met us everywhere on our way, and begged and implored us to use our efforts for their immediate relief, and related instance after instance of the loss of their crops. Many expressed themselves as being determined to abandon their furth er attempts to grow crops on their lands until the nuisance be abated. The counties now affected are Fannin, Gilmer, Union, Murray and Towns, in order named; and we have been reliably informed that the damage to timber has been plainly traced into Rabun county, some seventy miles distant from the smelters.

The section being affected is a very important one to the whole country, it being a great water-shed, where many of the important rivers of the South have their source; and it lies in the heart of the proposed Appalachian Forest Prese rve. It is a section of country, where nature has been most lavish in her gifts; where grow the giant poplar, the sturdy and massive oaks, the stately and majestic white pine, the lacy hemlock, the chestnut, hickory, buckeye, and numerous other forest giants, fringed with innumerable other trees and bushes, ferns and mosses, all making a great sponge, or an ideal nature's fountain. Here are absorbed the rains and showers that fall, and are held in this great natural reservoir to gently percolate through all, in the form of numerous clear and cold springs, which unite in little rills and rivulets. These form brooks, which dash and flow over rocks and boulders on their way to form the creeks, and, they in turn, the rivers. The banks of these streams are covered with laurel and rhododendron, mountain azaleas, holly, calicanthus, dogwood, and other flowering shrubs. Th ese beautiful streams, cool, clear and limpid, coming direct from nature's fount, are purity itself. Herein, sport the lovely brook trout; and, in streams that have been stocked by the United States Government, the Rocky Mountain or Rainbow trout are thriving and increasing in great numbers. It is this fair country on which the hand of this aw-

ful scourge is laid so heavily, and it will be not only the inhabitants and owners of these lands who will suffer, but all the country to which these streams are tributary, and through which they pass on their way to the ocean. Since these poisonous gases kill not only the old and matured timbers, but all the vegetation on the ground, nature's fount will thereby be ruined. The sun will get in and parch and dry up the hungry earth, so that it will become baked and seared. The water will run off as fast as it falls, producing periods of tremendous freshets and floods, followed by long and far-reaching droughts. For the rain falling then, not held back as formerly, when it slowly made its way through the thick mass of foliage and rich spongy earth, will pass off like a cloudburst down the denuded and parched courses. Until recently, the streams of this water-shed have had the most even flow of any in the United States, which the complete destruction of these forests will disturb entirely, besides rendering useless all the valuable water-power, operating cotton mills and other industries on the rivers below.

This commission advised the attorneys of the Tennessee Copper Company of their intended visit to their section and works, and did visit their offices at Isabella, and asked for any suggestions that the company might have to make, as to any provision that they were making or had in view to relieve the situation; but they got no definite information from their manager, Mr. Adams, whom we saw there. We found the Tennessee Copper Company are using all possible energy to push to early completion four new furnaces to smelt green ore at Isabella; and since they are now using only three furnaces, it is plain to see what will be the result when these four additional furnaces are blown in, on green sulphur ore, with no provision whatever that we could learn of, to care for these increased fumes. In the words of the previous commission who investigated this nuisance and were appointed by a former General Assembly and approved by your Excellency, we beg to repeat, "in our opinion it being better that this entire industry should be completely annihilated than that the present intolerable condition should continue."

Therefore, we respectfully recommend that your Excellency

hrough the Attorney-General, and in the name of the State, do immediately begin proper legal proceedings to abate said nuisance and to arrest the damage now being done to the property of the citizens of this commonwealth.

A number of photographs representing certain scenes in the district described are herewith submitted.

Respectfully submitted,

Signed: T. G. HUDSON,
Commissioner of Agriculture.
W. S. YEATES,
State Geologist.
JOHN M. McCANDLESS,
State Chemist.
WILL H. SHIPPEN,
J. R. CHASTAIN.

EXHIBIT "H."

Whereas, by resolution approved August 15, 1905, the commission therein named was directed to investigate and report the injuries if any wrought in the counties of Murray, Gilmer, Fannin, Union and Towns by sulphur and copper fumes, gases and smoke generated by or through the works and mines at and near Dacktown, Tennessee, and,

Whereas, after full investigation, said committee has reported great and grievous injury to the territory of the State of Georgia by said smoke, fumes and gases, and recommend and urge immediate legal steps for the abatement thereof, and,

Whereas, I am authorized and directed by said resolution as well as by the general power and duties as Governor in me vested, in the event of report of injury to the territory of Georgia to take such steps and direct such legal proceedings as I deem necessary to secure an abatement of such injury;

It is therefore ordered that suit to such end be duly filed.

This the 21st day of September, 1905.

J. M. TERRELL, Governor.

O.T. 1906

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Clerk.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1906

No. 1 Orig.

O.T. 1907

No. 13, Orig.

THE STATE OF GEORGIA, BY ITS ATTORNEY GENERAL, JOHN C. HART, PLAINTIFF,

vs.

THE TENNESSEE COPPER COMPANY AND THE DUCKTOWN SULPHUR, COPPER AND IRON COMPANY (LIMITED), DEFENDANTS.

IN EQUITY.

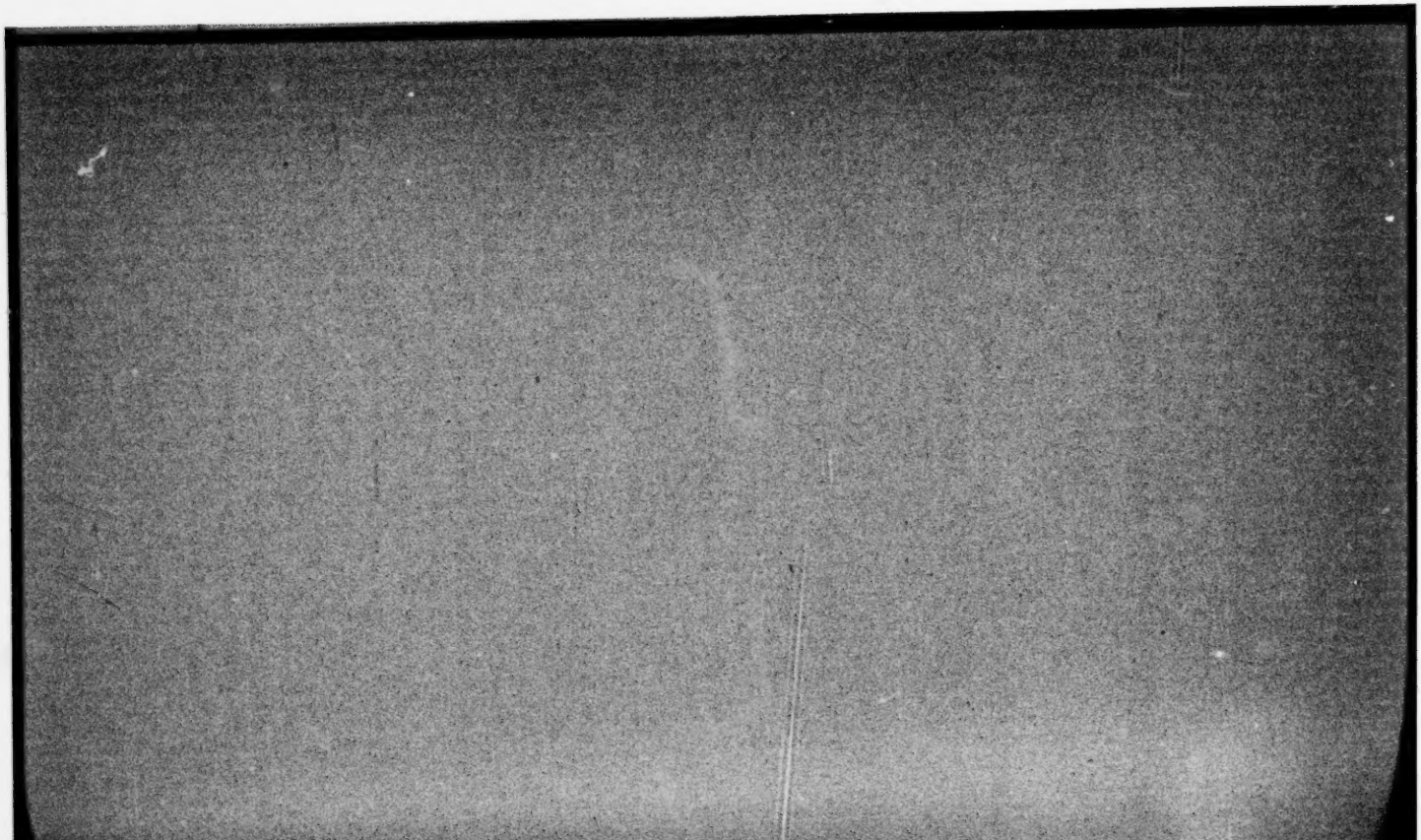
ARGUMENT AND EXHIBITS ON APPLICATION FOR LEAVE TO FILE AND FOR RESTRAINING ORDER.

THE STATE OF GEORGIA,
By JOHN C. HART,
Attorney General of Georgia.

LIGON JOHNSON,
Of Counsel.

ATLANTA, GEORGIA.

JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C. 18674



SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1905.

THE STATE OF GEORGIA, BY ITS ATTORNEY GENERAL, JOHN C. HART, PLAINTIFF,

vs.

THE TENNESSEE COPPER COMPANY AND THE DUCKTOWN SULPHUR, COPPER AND IRON COMPANY, DEFENDANT.

IN EQUITY.

STATEMENT.

The State of Georgia, by its attorney general, seeks to file its bill in equity against the Tennessee Copper Company and the Ducktown Sulphur, Copper and Iron Company (Limited) to restrain the operation of their copper-reduction works at and near Ducktown, Tennessee, and for a temporary injunction to prevent the Tennessee Copper Company during the pendency of the suit from beginning the operation of four new furnaces now in course of completion.

The case, so far as the jurisdiction of this honorable court is concerned, has already been considered under original cause 14. A bill seeking injunction against the copper works was permitted filed therein to the October term, 1903, and during the pendency of same the defendants submitted a proposition agreeing to abandon the then existing mode

of roasting and in its place to install appliances for the reduction of the ore on a wholly different principle, which proposed mode defendants declared would eliminate the smoke and nuisance complained of, the State to dismiss her bill upon the conclusion of such agreement. This proposition and new plan of reduction was submitted to the committee theretofore appointed by Georgia to investigate conditions at Ducktown, which committee recommended that same be accepted, believing that the plan proposed would have the effect represented by defendants; and in accordance with said proposition an agreement specifying the abandonment of the open-heap method was entered into and filed in said cause, and thereupon the cause, to all other effects, was dismissed without prejudice.

New appliances to the extent of the former capacity of the works were installed by the Tennessee Copper Company about the spring of 1904, the same consisting of two furnaces and blowing engines connected with a single chimney, but located, however, several miles nearer; in fact, within a few hundred yards of the Georgia line. A short time afterwards still another furnace was added, giving a total of three furnaces.

Almost immediately upon the operation of the newly installed process it was discovered that same was even more injurious than the open-heap roasting, and the defendant, The Tennesse Copper Company, was so notified. Instead, however, of seeking to diminish the amount of sulphur dioxide (the poisonous gas occasioning the damages complained of) the Tennessee Copper Company began and has about completed four additional furnaces, more than doubling the capacity of the plant, and which, if permitted to operate, will likewise more than double the amount of sulphur dioxide generated, as well as the damages occasioned thereby and the territory subject thereto.

For the information of the court the following have been

filed with the clerk thereof, copies of which have been printed and attached thereto as exhibits:

Letter of the Tennessee Copper Company relative to the expected relief from the smoke and nuisance by the abandonment of open-heap roasting and the institution of the new process.

Agreement for abandonment of the old process and for dismissal of original cause 14 thereupon.

Affidavit of John M. McCandless, chemist, as to the scope and effect of the sulphur dioxide generated by the Tennessee Copper Company.

Affidavit of W. S. Yeates, geologist, as to the scope and effect of the sulphur fumes involved.

Affidavit of T. G. Hudson covering the same matter and verifying the report of the commission of 1905.

Photographs of the locality affected by the fumes.

Reference is also respectfully urged to the following publications:

Bulletin 89 of the United States Department of Agriculture, Bureau of Chemistry.

United States Geological Survey report, under title "Mineral Resources of the United States for 1903."

House Document, volume 44, session of 1902–1903.

House Document, volume 37, session 1900–1901.

60 Southwestern Reporter.

83 Southwestern Reporter.

The report under Bulletin 89 of the Bureau of Chemistry was upon a condition similar to, but by no means so extensive as, produced by the Ducktown furnaces. The works in Shasta county, California, were located in a deep narrow gulch, with mountain peaks to shield the surrounding country. In the investigation by the United States of the effects produced by the sulphur dioxide generated by the Shasta county works it was disclosed that copper dioxide of the strength of one part to one million of air was injurious to plant life, and the destructive quality of fumes of greater strength was

fully recognized. We are informed by the Department of Justice that the injunction sought against the works reported upon was granted by the lower court, and the matter is now pending on appeal to the circuit court of appeals.

Instead of in a narrow gulch, Ducktown is situated about the center of a depression of the foot hills near the boundary lines between Georgia and Tennessee. Valuable timber is found in the locality, and various farm products, such as oats, corn, and wheat, and likewise fruits and garden vegetables, are raised, although in the immediate vicinity of the works the soil is not particularly fertile (McGehee *vs.* Tennessee Copper Company, 83 Southwestern, 659).

That the copper companies as operated are both a public and private nuisance, and have done and are doing irreparable damage, is no longer an open question in Tennessee, for in Ducktown Sulphur, Copper and Iron Company *vs.* Barbes, 60 Southwestern, 600, and in the McGehee case, just cited, such is held in no uncertain terms. In speaking of the effects of the fumes generated by defendants upon the property of the plaintiffs the supreme court of Tennessee, in the latter very recent case, declared:

"Their timber and crop interest have been badly injured, and they have been annoyed and discommoded by the smoke so that the complainants are prevented from using and enjoying their farms and homes as they did prior to the inauguration of these enterprises. The smoke makes it impossible for the owners of farms within the area of the smoke zone to subsist their families thereon with the degree of comfort they enjoyed betore. They cannot raise and harvest their customary crops and their timber is largely destroyed."

On page 660 it was further stated that the smoke produced "coughing" and "headache" and was "injurious to health."

In this case it is true the court begs the direct question of injunction and uses the discretion alleged to have been granted it under Tennessee statutes to assert, in effect, the

right of eminent domain in the copper company as against their litigants and to force the plaintiffs to accept damages in lieu of injunction. The court further claims to base its decision upon the assumption that the copper companies had obtained prescriptive rights to generate the smoke and fumes by having done so for a great number of years.

Regardless of the legality of such a contention, the facts as shown by the reports of the United States Geological Survey exhibit the falseness of the assumption. Fifteen years before the filing of the McGehee suit there was not as much copper produced per year throughout the entire South as can now be produced per day by the Ducktown copper works alone. The gross production of copper throughout the Southern States from 1885 to 1889, inclusive, was approximately but 125,000 pounds, the production for 1886 being 29,811 pounds, and for the years 1887, 1888, and 1889 only about 18,000 was smelted annually (House Document, 1900–1901, volume 37, page 168 *et seq.*). The annual capacity of the Tennessee Copper Company alone will exceed 20,000,000 pounds per annum (House Document, 1903–1904, volume 92).

The Ducktown Sulphur, Copper and Iron Company first filed its copy of charter in Tennessee December 19, 1891, but did not begin its production to full capacity until about three or four years ago, and up to 1900 the Ducktown Copper Company did not produce exceeding 1,000,000 pounds of copper per annum.

The Tennessee Copper Company first began its smelting in August, 1901, but it was May, 1902, before full smelting operations were conducted (House Document, 1902–1903, volume 44, page 174).

It may well be remarked just here that in the early part of 1903 Georgia demurred to the conditions occasioned by the copper works, and later filed its protest with the State of Tennessee praying that Tennessee abate the nuisance arising through its copper companies at Ducktown, and upon Ten-

nessee's refusal so to do, Georgia filed its bill to the October term, 1903, of this honorable court.

In concluding its opinion in the McGehee case, ante, the court states:

"In order to protect by injunction several small tracts of land aggregating in value less than $1,000 we are asked to destroy property worth nearly $2,000,000, and wreck two great mining and manufacturing enterprises. * * * We appreciate the argument based on the fact that the homes of complainants who live on small tracts of land referred to are not so comfortable and useful to their owners as they were before they were affected by the smoke complained of, and we are deeply sensible of the truth of the proposition that no man is entitled to any more rights than another on the grounds that he owns more property than another. But in case of conflicting rights where neither party can enjoy his own without in some measure restricting the liberty of the other in the use of his property, the law must make the best arrangement it can between the contending parties."

The court then declares the best arrangement is to require the copper companies to give bond to pay any damages that might be assessed in favor of the plaintiffs in the case; otherwise an injunction is to issue.

Certainly even under the unusual reasoning adopted in this decision the copper companies would not be permitted at will to double the injuries being wrought as well as add new and virgin territory to the sulphur dioxide zone.

The major portion of the damage at present is being done by the Tennessee Copper Company, as it smelts about four times the amount of ore used by the Ducktown Sulphur, Copper and Iron Company, and if the new furnaces are allowed to operate the Tennessee Copper Company will have about ten times the capacity of the Ducktown Copper Company in addition to having its furnaces much nearer the Georgia line than the works of the latter corporation.

The new furnaces of the Tennessee Copper Company were built in the face of the knowledge that the furnace process

was creating as great or greater nuisance than the open roast heap ever caused. The new furnaces now sought to be restrained were not begun until some time after the first furnaces erected were tried out and the generation of sulphur dioxide in highly concentrated form clearly disclosed. Under the statistics furnished by the officials of the Tennessee Copper Company to the United States Geological Survey (title Mineral Resources of the United States for 1903, page 219) in 1904 concerning the plans of the Tennessee Copper Company for the year 1904 and the production of copper during the past year of 1903 it is set forth:

"The Tennessee Copper Co. is forging ahead, having in 1903 produced 10,690,389 pounds of fine copper, as compared with 8,103,534 pounds in 1902. A third furnace and blowing engine were in course of construction * * * It has been determined to increase the smelting capacity from 300,000 to 600,000 tons by enlarging the smelter from 3 to 6 furnaces. The new construction will extend over 18 months, so that the enlarged output will not come into play until well into 1905. The company is carrying out the plan of smelting unroasted or green ore which will not only reduce the operating costs but will increase the extraction, and will make a saving of not less than one cent per pound on the copper."

By the affidavits of John M. McCandless, chemist; W. S. Yeates, geologist, and T. G. Hudson, commissioner of agriculture of the State of Georgia, as well as by the report of the committee of 1905 appointed by the State of Georgia, it is shown that with the production as it now stands and without the operation of the new furnaces of the Tennessee Copper Company the injury being inflicted upon the State of Georgia and her citizens is infinitely greater than that done by the companies under the old method of open-heap roasting.

It is beyond dispute that if the new furnaces are permitted to operate, the damage being done and territory subject to the fumes will be more than doubled. Should the

old works and all the furnaces now in operation be closed down and the new furnaces of the Tennessee Copper Company alone be permitted to smelt the ore, enough sulphur dioxide will be generated and liberated to render irrespirable and unfit for all vegetable life an atmosphere of 100 feet thick and covering 243 square miles of territory. In other words, should the air contaminated and rendered poisonous by the sulphur dioxide rest evenly upon the earth in each direction with the works as a center, its noxious effects would reach throughout a circle of country, the diameter of which circle would be about 18 miles. If allowed to be added to the fumes now being generated by the defendants, about 250 square miles of new territory will be added to the zone subject to the poisonous effects of the sulphur dioxide and the diameter of the circle lengthened to 25 miles (affidavit of McCandless). With the concentrated fumes and natural wind currents which would at times prevail, the territory subject to the fumes would of course be infinitely greater, as during the period of south and southeast winds the entire fumes would be driven within the territory of the State of Georgia. Only a few hours of the continued presence of these fumes is necessary for the absolute destruction of the tenderer forms of vegetable life, such as garden products and fruit trees, and but a limited time is required for injury beyond recovery of even the hardy forest timber.

By the report to the United States Geological Survey heretofore referred to it is made apparent that the original incentive for the installation of the furnace process was not the hope of eliminating the sulphur dioxide, but to accomplish in the production "a saving of not less than one cent per pound on the copper," which, on a production of 20,000,000 pounds of copper per annum, would reach the large sum of $200,000 per year of increased profit.

Should the new furnaces be allowed to operate, not only will a great increase of all damages occurring and threat-

ened be brought about, the zone of territory subject to the noxious effects of the fumes be much enlarged, but by reason of the increased strength and volume of the fumes all injuries will be accomplished in a much shorter space of time.

It is urged that without the restraining order directed to the Tennessee Copper Company, as prayed, Georgia, her citizens and her territory, will be irreparably damaged.

Respectfully submitted.

JOHN C. HART,
Attorney General of Georgia.
LIGON JOHNSON,
Special Counsel.

Letter of Tennessee Copper Company.

FEBRUARY 9TH, 1904.

GOV. JOS. M. TERRELL, *Atlanta, Ga.*

DEAR SIR: Referring to the proceeding instituted by the State of Georgia *vs.* The State of Tennessee *et al.*, I beg to advise you that as president of the Tennessee Copper Co., one of the codefendants in this suit, that we are now preparing to make such changes in our smelting operations that I am of the opinion, and in fact can guarantee to you, that by the 1st of August, 1904, we will have ceased producing smoke from our roast yards. At the present time the Ducktown Sulphur, Copper & Iron Co. has entirely ceased roasting any ore and the roast yards are abandoned. The Tennessee Copper Co. is awaiting the installation of a third blowing engine, and when this is erected, so that the third furnace may be put in operation, they also intend to cease putting any more green ore upon the roast yards. This date we presume will be about the 1st of April.

I desire to call your attention to the fact that it takes from three to four months to roast ore after it has once been lighted, and therefore it is physically impossible to stop the

roasting when it is once under way. To be concise our proposed method of smelting, which is now in successful use by the Ducktown Company, is to smelt the green ore directly in blast furnaces without preliminary roasting. The result is that, instead of producing smoke, only a gas is produced, which, being heated and concentrated, immediately rises to a great elevation and becomes so diluted with air as to be practically dissipated.

I call your attention to our intentions in this matter, so that you may postpone any action against us until such times as we have demonstrated the practical success of this new method, and which, as I say, we have every reason to believe will be in full operation in August or September of this year.

Yours very truly,

(Signed) J. Park Channing,
Pres. Tennessee Copper Co.

On behalf of the Ducktown Sulphur, Copper and Iron Co. (Ltd.) I beg to state the discovery of a new process has enabled this company to abolish the former practice of roasting its ore, that the new process is now in actual and successful operation, and that the roasting of ore will not again be resumed.

(Signed) W. H. Freeland,
Gen. M'g'r Ducktown S., C. & I. Co. (Ltd.).

Agreement to Abandon All Process and to Dismiss Cause.

IN THE SUPREME COURT OF THE UNITED STATES,
OCTOBER TERM, 1903.

THE STATE OF GEORGIA *vs.* THE DUCKTOWN SULPHUR, COPPER AND IRON CO., THE TENNESSEE COPPER CO., and THE PITTSBURG AND TENNESSEE COPPER CO., *Defendants.*	In Equity.

Whereas, the State of Georgia filed its bill in equity against the above-named defendants on the — day of ——, 1904, in the Supreme Court of the United States, which suit is now pending, in which bill of complaint it is alleged by the State of Georgia that her public domain is injured by the defendant copper companies above named by certain sulphurous smoke, fumes, and gases originated by the defendants in the operation of their open roast heaps for treating copper and sulphur ores; and

Whereas, at the time said suit was filed the Ducktown Sulphur, Copper and Iron Company (Limited) and the Pittsburg and Tennessee Copper Company was no longer roasting their ores in the open beds or roast heaps producing the alleged dense smoke and attendant fumes and gases complained of; and

Whereas, the Tennessee Copper Company since the filing of the bill in this cause has abandoned the roasting process and has lighted its last roast heap, and that each and all of said companies have heretofore and by this agreement declared that after the present ignited heaps have burned out neither of them will again return to said method of roasting their ores, of which method the State of Georgia especially complained:

It is therefore agreed between the State of Georgia and the defendants in consideration of this stipulation on the part of said companies not to return to said method of roasting their said ores, that an order shall be entered specifying that said bill shall be dismissed.

It is further agreed that this stipulation and agreement shall be made a part of and filed in said case and an order of dismissal issued in accordance therewith.

It is further stipulated that the dismissal of said suit shall in nowise be construed as an adjudication of any of the questions involved therein and that it shall not operate to the prejudice of the rights of either or any of the parties beyond the terms of this agreement.

THE TENNESSEE COPPER COMPANY,
By HOWARD CORNICK, *Of Counsel.*
THE PITTSBURG AND TENNESSEE COPPER CO.,
By HOWARD CORNICK, *Of Counsel.*
THE DUCKTOWN SULPHUR, COPPER AND IRON CO. (LTD.),
By W. H. FREELAND, *General Manager.*
THE STATE OF GEORGIA,
By JOHN C. HART,
Attorney General of Georgia.
LIGON JOHNSON, *Special Attorney.*

Affidavit of John M. McCandless.

IN THE SUPREME COURT OF THE UNITED STATES,
OCTOBER TERM, 1905.

THE STATE OF GEORGIA, *by Its Attorney General*, JOHN C. HART, *Plaintiff*,
vs.
THE TENNESSEE COPPER COMPANY and THE DUCKTOWN SULPHUR, COPPER AND IRON COMPANY (LIMITED), *Defendants*. } No. —.

STATE OF GEORGIA,
County of Fulton.

Personally appeared before the undersigned authority John M. McCandless, who, being duly sworn, deposes and says:

Affiant is a chemist by profession and has been for the past twenty years, and is now State chemist for the State of Georgia, which office affiant has held since 1898. In his capacity as State chemist affiant was a member of the commission of 1903 and 1905 appointed by the State of Georgia to investigate and report upon the damage, if any, being done to the State of Georgia and her territory in the neighborhood of Ducktown, Tennessee, by the copper-reducing plant located there.

Affiant personally made a careful investigation in the autumn of 1903, and found the Tennessee Copper Company roasting its ores in open roast heaps and liberating large quantities of sulphur dioxide, which had done, and was then doing, great damage to the timber, fruit, and vegetation for a considerable distance within the State of Georgia.

The investigation of 1905 disclosed the fact that the Ducktown Sulphur, Copper and Iron Company and the Tennessee Copper Company had abandoned open heap roasting and were reducing their copper by a new method, under which

the green unroasted ore was smelted in a furnace, and all the sulphur gases produced in the process are thus concentrated in the throat of a single chimney for the plant of each of said companies and emitted therefrom. The Tennessee Copper Company, which generates the major portion of the gas liberated, had in addition removed its plant to a point much nearer the Georgia line.

The new process results in concentrating the gases, which were formerly liberated over a wide area from the open roast heap into a narrow and circumscribed locality. Owing to the further fact that the height of these stacks or chimneys is quite low as compared with the surrounding country, the plants being located in a valley or depression of mountainous country, the gases have little or no chance to diffuse into the circumambient atmosphere before they are swept by the wind currents against and over the high wooded ridges and hills of the surrounding region. The composition of these gaseous currents, being doubtless much richer in sulphur dioxide by reason of their concentration at the point of origin than those from the old roast heap system, would naturally have a more destructive effect upon the forest trees and other vegetation against which they are driven by the winds than would have been the case under the old system.

When sulphur, either as brimstone or combined with iron, as pyrites is burned in the air it unites with the oxygen of the air to form SO_2 or sulphur dioxide, also known as sulphurous anhydride. Sulphur dioxide unites readily with the elements of water whenever found, either as vapor in the atmosphere or as rain or dew or with the water which exists as a natural constituent of the bodies of plants and animals when inhaled. The chemical formula of water is H_2O, or two atoms of hydrogen and one of oxygen, which coming in contact with one atom of sulphur and two of oxygen, SO_2, combine with them to form a molecule of H_2SO_3, or sulphurous acid, which must be carefully differentiated

from sulphuric acid, which contains another atom of oxygen and has the formula of H_2SO_4, and is a much more destructive and corrosive acid than the sulphurous.

Observation and experience not only in America but also in Europe shows that the sulphur dioxide given off from chemical works and from smelting works and roasting heaps are very injurious and deadly to vegetation. Schroeder has shown that sulphurous acid is absorbed by the leaves of deciduous trees and conifers. The leaves retain it mostly, a smaller part penetrating into the wood, the bark, and leaf stalks either as sulphur dioxide or, after oxidation, as sulphuric acid. Morren shows that the leaves are more sensitive to sulphur dioxide than flowers. When present in a proportion of one to eighty thousand in the air the leaves of fruit trees are visibly affected in three to five hours, and this effect seems to spread after the direct action of the gas ceases. Adult leaves are usually more sensitive than young leaves. Sulphurous acid dissolved in water is almost without effect, while on the lower surface each little drop causes a formation of a spot visible on both surfaces. This solution is not quickly changed into sulphuric acid, the effect of the latter being quite different from that of sulphurous acid.

The Bureau of Chemistry, U. S. Department of Agriculture, has shown that as little as one part of sulphur dioxide in one hundred thousand of air does serious damage to vegetation; in fact even so small an amount as one part to one million of air is injurious.

The new furnaces in course of installation by the Tennessee Copper Company will raise, so affiant is informed, the capacity of said works from the present output of about twelve million pounds of copper per annum to twenty-five million. If from an ore carrying a little less than 3 per cent. copper we estimate an efficiency of extraction of 2 per cent., it would require one billion two hundred and fifty million pounds of ore to yield twenty-five million

pounds of copper. The ore is reported to contain 30 per cent. sulphur, and if we allow that one-half of this sulphur remains behind in slag and matte, instead of only one-third, as in the case of copper, and one-half is thrown out into the air in the form of sulphur dioxide, we should have three hundred and seventy-five million pounds of sulphur dioxide belched into the atmosphere from these furnaces. Supposing the air now to be contaminated with it in the proportion of one to one hundred thousand, we should have 495,000,000,000,000 cubic feet of air, or 177,557 square miles of air, one hundred feet in thickness, emitted for a period of one year. For a period of one day the atmosphere for a thickness of 100 feet would be contaminated for 486 square miles, or in a circle with the furnaces in the center the impregnated atmosphere would extend 12½ miles in every direction.

From the new furnaces alone of the Tennessee Copper Company, estimating their capacity at 12,500,000 pounds of copper per annum, enough sulphur dioxide would be generated daily to render noxious 243 square miles of atmosphere 100 feet thick, and if all the old works, both of the Tennessee Copper Company and the Ducktown Sulphur, Copper and Iron Company, were abandoned and left idle, and only the new furnaces of the Tennessee Copper Company now in course of completion operated, enough sulphur dioxide would be generated to contaminate the atmosphere to a thickness of 100 feet within a circle of territory 17.6 miles in diameter. Operated in conjunction with the remaining works, the contamination of the atmosphere and all damages incident thereto will increase in proportion to the increase of sulphur dioxide which will be generated by the new furnaces.

It is evident from a consideration of these facts that in course of time the air of the habitable globe would be rendered irrespirable by plants and animals were it not for the solubility of sulphur dioxide in water, and the further fact

that the sulphur dioxide is washed out of the air by rain and carried to the sea through the water-courses.

JNO. M. MCCANDLESS.

Sworn to and subscribed before me this 11th day of October, 1905.

[SEAL.] E. H. BARNETT,
Notary Public, Fulton County, Georgia.

Affidavit of W. S. Yeates.

IN THE SUPREME COURT OF THE UNITED STATES,
OCTOBER TERM, 1905.

THE STATE OF GEORGIA, *by Its Attorney General,* JOHN C. HART, *Plaintiff,*
vs.
THE TENNESSEE COPPER COMPANY and THE DUCKTOWN SULPHUR, COPPER AND IRON COMPANY (LIMITED), *Defendants.*
} No. —.

STATE OF GEORGIA,
County of Fulton.

Personally appeared W. S. Yeates, who, being duly sworn herein, on oath says:

Affiant is a geologist by profession and has been for the past 24 years, and is now and since May 15, 1893, has been State geologist for the State of Georgia.

Affiant was a member of both commissions appointed by the State of Georgia to investigate the conditions arising from the copper and sulphur smoke and fumes generated by the Ducktown and Tennessee Copper Companies, to wit, the commissions of 1903 and 1905.

Affiant, both in 1903 and 1905, made a careful and thorough investigation of the territory of the State of Georgia in near proximity to the Ducktown copper works.

In the examination of 1903 it was disclosed that the copper and sulphur smoke and gases were doing great injury to the vegetation, fruit, and timber in the State of Georgia within a radius of a number of miles from the point on the Georgia line nearest to Ducktown, Tennessee.

In the immediate vicinity of the works the soil was not only wholly denuded of timber and vegetation, but by reason of the lack of such vegetation the rains had washed away the soil capable of producing vegetables, crops, or timber, leaving only decomposing rocks, incapable of sustaining vegetable life. Such a condition is the inevitable result of the continued destruction of all vegetable life, which in turn prevents retention by the earth of the moisture precipitated in such locality, occasioning, as a rule, the failure of springs and streams dependent thereon for their water supply.

The investigation of 1905 disclosed that the Tennessee Copper Company, from whose works the major portion of the damage arises, had removed its smelting plant to a point much nearer—in fact, only a short distance from the Georgia line—and had changed its process from open-heap roasting to reducing by furnace, which new process concentrated all smoke and gases within the narrow area of a chimney and gave them forth in a many-time stronger form than same were generated through the former method of roast heaps.

The chimney connected with said furnace was of sufficient height to lessen the injury to the immediate locality—that is, within a hundred yards or so of the works—but beyond this limited area the power to injury by said fumes was made many times greater.

Under the present process the territory subject to the hurtful effects of said fumes is much larger than that within the influence of the old process. It is difficult to say how many miles within the State of Georgia the fumes may have effect, but it is beyond peradventure true that the territory

has greatly increased since the furnace process was installed by the Tennessee Copper Company.

The Tennessee Copper Company has three furnaces in operation and four in course of erection, which, when completed, will more than double the capacity of the works and also the injuries being occasioned thereby. The operation of the new furnaces will greatly increase the territory subject to the ruinous effects of said fumes and double the damages hereinbefore specified, both as being done and threatened, which damage, by reason of the greater strength and volume of the fumes, will be accomplished much more speedily than could now be accomplished.

W. S. YEATES.

Sworn to and subscribed before me this 11th day of October, 1905.

[SEAL.] W. H. HARRISON,
Notary Public, Fulton County, Georgia.

Affidavit of T. G. Hudson.

IN THE SUPREME COURT OF THE UNITED STATES,
OCTOBER TERM, 1905.

THE STATE OF GEORGIA, *by Its Attorney General,* JOHN C. HART, *Plaintiff,*
vs.
THE TENNESSEE COPPER COMPANY and THE DUCKTOWN SULPHUR, COPPER AND IRON COMPANY (LIMITED), *Defendants.*
No. —.

STATE OF GEORGIA,
County of Fulton.

Now comes T. G. Hudson, who, being duly sworn herein, on oath says:

That he is the commissioner of agriculture of the State of Georgia and one of the committee appointed under a reso-

lution of the General Assembly of Georgia to investigate and report upon the damage done within the State of Georgia by sulphur and copper fumes generated by the copper works at and near Ducktown, Tennessee.

Affiant carefully investigated conditions occasioned by the smoke and fumes generated by said copper companies, which investigation disclosed that said smoke, fumes, and gases had done and were doing enormous injury within the State of Georgia. Timber, crops, gardens, and orchards had been and were being destroyed, and it was clearly apparent that the zone subject to the hurtful influence of such fumes was rapidly, in fact almost daily, being enlarged, and the damage in the locality already subject to the fumes constantly increasing.

The smoke, fumes, and gases causing the damage are originated by the Ducktown Sulphur, Copper and Iron Company and the Tennessee Copper Company, the latter, however, being located much nearer the Georgia line and producing by far the largest amount of copper, causes the larger part of the injury.

The Tennessee Copper Company has recently removed its reducing plant to a point some miles nearer the Georgia line than its former location, and the gases being concentrated and discharged from a tall chimney are carried much farther into Georgia territory than they could have been formerly under the open-heap process of reducing ore.

The Tennessee Copper Company also has in course of erection additional furnaces, which affiant is informed will double the capacity of said works. If such furnaces are permitted to operate, the damage to the State of Georgia and her territory will be greatly increased, and affiant believes more than doubled in amount and territory affected.

Affiant hereto attaches a copy of the report submitted by affiant and his fellow-commissioners, which report affiant avers to be true in substance and in fact.

T. G. Hudson.

Sworn to and subscribed before me this 10th day of October, 1905.

[SEAL.]

W. H. HARRISON,
Notary Public, Fulton Co., Ga.

Copy.

ATLANTA, GA., *August 30th*, 1905.

To His Excellency J. M. Terrell, governor of Georgia.

SIR: We, the commission appointed under and acting by authority of a joint resolution of the General Assembly of this State at its last session, and approved by Your Excellency, beg to report as follows:

Said resolution provided that this commission promptly investigate the damage done and now being done to vegetation, timber, fruit, and the farming interests of the northern part of this State by the gases, fumes, and smoke being generated by the copper plants at and near Isabella, Polk county, Tennessee, and report to Your Excellency the conditions found there. Pursuant to the above, this commission did visit the above-named section on the 28th and 29th of August and inspected a considerable portion of said territory. We found conditions there alarming in the extreme, and we haven't words at our command to impress on Your Excellency the instant, urgent, and imperative need of immediate action for relief, if that part of our State is to be saved to its present owners and our Commonwealth. The signal destruction to young and old timber and almost all vegetation was appalling in the extreme, and impressed all as we journeyed through the stricken district. From the high ridges, where a view could be gotten of the landscape and surrounding country, much of the foliage was brown and seared and had much the appearance of having been visited by fire or heavy frost, the leaves being more or less brown or seared. In the woods the leaves are falling,

or have fallen, and the ground is covered thick with withered and dead leaves, as one would expect to find in late November did healthy conditions prevail. Many of the crops we found on the land were more or less affected; corn, field peas, potatoes, and many hardy weeds showed only too plainly the effects of the action of the fumes. It is our unanimous opinion that the new process as adopted by the Tennessee Copper Company is proving and has proven far more injurious to vegetation, fruit, farming, and the timber interests of this portion of our State than the old process ever was. This is clearly proven by the timber, much of which put out in full leaf in the spring, and this has been killed since. When the open-roast heaps were used under the old process, they were located near Ducktown, and the sulphurous gases were largely liberated there. Since the adoption of the new method by the Tennessee Copper Company they have located their furnaces for the smelting of the green sulphur ores at Isabella, some four miles nearer the territory of this State.

The present furnaces, with their forced draft and very high heat, drive the fumes and gases from the sulphur ore high into the air, so that the prevailing winds carry and drift them in whichever direction they may be blowing at the time. These concentrated fumes leave the furnace stack in the form of sulphur dioxide or anhydrous sulphurous oxide. This is carried by the currents of air and the wind to a greater or less distance, according to the velocity of the wind or the humidity or lightness of the air, and is turned into deadly sulphurous acid whenever it happens to come into contact with moisture in the air, and is thus precipitated in this form to the earth, settling on the soil and all growing vegetation.

We find the effects of this highly corrosive and dangerous compound on the delicate foliage, and it is burned, blistered, and seared as if by extreme heat or heavy frost. As these smelters are now conducted, they are daily and nightly

handling hundreds of tons of these ores, containing a very high per cent of sulphur; and as each pound of sulphur burned produces two pounds of sulphur dioxide, it is very easy to see the magnitude of this evil that is hourly and daily being turned loose in the surrounding country, to blight and kill all growing crops and vegetation.

It has been satisfactorily proven by the Bureau of Chemistry of the United States Department of Agriculture that one part of sulphur dioxide mixed with one hundred thousand parts of air does great damage to vegetation, and also that one part of sulphur dioxide mixed with one million parts of air seriously injures vegetation, if it be exposed for any length of time. This has been thoroughly demonstrated by other chemists and biologists who have worked on the subject, among them being A. Stockhardt and A. Wieler.

The citizens and farmers of the stricken district met us everywhere on our way and begged and implored us to use our effort for their immediate relief and related instance after instance of the loss of their crops. Many expressed themselves as being fully determined to abandon their further attempts to grow crops on their lands until the nuisance be abated. The counties now affected are Fannin, Gilmer, Union, Murray, and towns in order named, and we have been reliably informed that the damage to timber has been plainly traced into Rabun county, some seventy miles distant from the smelters.

The section being affected is a very important one to the whole country, it being a great watershed, where many of the important rivers of the South have their source; and it lies in the heart of the proposed Appalachian forest reserve. It is a section of country where nature has been most lavish in her gifts; where grow the giant poplar, the sturdy and massive oaks, the stately and majestic white pine, the lacy hemlock, the chestnut, hickory, buckeye, and numerous other forest giants, fringed with innumerable other trees and bushes, ferns and mosses, all making a great

sponge, or an ideal nature's fountain. Here are absorbed the rains and showers that fall, and are held in this great natural reservior to gently percolate through all, in the form of numerous clear and cold springs, which unite in little rills and rivulets. These form brooks, which dash and flow over rocks and boulders on their way to form the creeks, and they in turn the rivers. The banks of these streams are covered with laurel and rhododendron, mountain azaleas, holly, calicanthus, dogwood, and other flowering shrubs. These beautiful streams, cool, clear, and limped, coming direct from nature's fount, are purity itself. Herein sport the lovely brook trout; and, in streams that have been stocked by the United States Government, the Rocky Mountain or Rainbow trout are thriving and increasing in great numbers. It is this fair country on which the hand of this awful scourge is laid so heavily, and it will be not only the inhabitants and owners of these lands who will suffer, but all the country to which its streams are tributary and through which they pass on their way to the ocean. Since these poisonous gases kill not only the old and matured timbers, but all the vegetation on the ground, nature's fount will be thereby ruined. The sun will get in and parch and dry up the hungry earth so that it will become baked and seared. The water will run off as fast as it falls, producing periods of tremendous freshets and floods, followed by long and far-reaching droughts; for the rain falling then, not held back as formerly, when it slowly made its way through the thick mass of foliage and rich, spongy earth, will pass off like a cloudburst down the denuded and parched courses. Until recently the streams of this watershed have had the most even flow of any in the United States, which the complete destruction of these forests will disturb entirely, besides rendering useless all the valuable water power operating cotton mills and other industries on the rivers below.

This commission advised the attorneys of the Tennessee

Copper Company of their intended visit to their section and works, and did visit their offices at Isabella and asked for any suggestion that the company might have to make as to any provision that they were making or had in view to relieve the situation, but they got no definite information from their manager, Mr. Adams, whom we saw there. We found the Tennessee Copper Company are using all possible energy to push to early completion four new furnaces to smelt green ore at Isabella, and since they are now using only three furnaces, it is plain to see what will be the result when these four additional furnaces are blown in, on green sulphur ore, with no provision whatever that we could learn of to care for these increased fumes. In the words of the previous commission who investigated this nuisance and were appointed by a former General Assembly and approved by Your Excellency, we beg to repeat, "in our opinion it being better that this entire industry should be completely annihilated than that the present intolerable condition should continue"

Wherefore we respectfully recommend that Your Excellency, through the attorney general and in the name of the State, do immediately begin proper legal proceedings to abate said nuisance and to arrest the damage now being done to the property of the citizens of this Commonwealth.

A number of photographs representing certain scenes in the district described are herewith submitted.

Respectfully submitted.

(Signed) T. G. Hudson,
Commissioner of Agriculture.
W. S. Yeates,
State Geologist.
Jno. M. McCandless,
State Chemist.
Will H. Shippen.
J. R. Chastain.

Orig I.

C.T. 1906

FILE COPY.

Office Supreme Court U. S.
FILED
NOV 27 1905
JAMES H. McKENNEY,
Clerk.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1905

No. 1 Orig.

O.T. 1906

~~No. 5 ORIGINAL.~~

STATE OF GEORGIA, BY ITS ATTORNEY GENERAL, JOHN C. HART, *Plaintiff* *vs.* THE TENNESSEE COPPER COMPANY, AND THE DUCKTOWN SULPHUR, COPPER & IRON COMPANY, LIMITED, *Defendants*	In Equity.

DEMURRER OF TENNESSEE COPPER COMPANY.

MARTIN H. VOGEL
Counsel.

HOWARD CORNICK,
JOHN H. FRANTZ,
Attorneys for the Defendant Tennessee Copper Company.

S. B. NEWMAN & CO., KNOXVILLE.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1905.

No. 13 ORIGINAL.

THE STATE OF GEORGIA, BY ITS ATTORNEY GENERAL, JOHN C. HART, . . Plaintiff

versus

THE TENNESSEE COPPER COMPANY, AND THE DUCKTOWN SULPHUR, COPPER & IRON COMPANY, LIMITED, . . . Defendants

} In Equity.

DEMURRER OF DEFENDANT, TENNESSEE COPPER CO.

Now comes the Tennessee Copper Company, one of the defendants in this cause, by its attorneys, and demurs to the bill of complaint filed herein, and says that the said bill of complaint and the matters therein contained, in the manner and form as the same are therein stated and set forth, are not sufficient in law for the State of Georgia to have and maintain its aforesaid action against the Ducktown Sulphur, Copper & Iron Company, Limited, and against this defendant, and that, there-

fore, this defendant is not bound by the law of the land to answer the same; and the said defendant states and shows to the Court here the following causes of demurrer to the said bill of complaint:

FIRST.

That this Court has no jurisdiction of either the parties to or the subject matter of this suit, **because** it appears upon the face of said bill of complaint that the matters complained of, as set forth therein, do not constitute, within the meaning of the Constitution of the United States, any controversy between the State of Georgia and the defendants herein.

SECOND.

Because said bill shows upon its face that this suit is in reality for and on behalf of certain individuals who reside in the State of Georgia, and in the counties of Murray, Gilmer, Fannin, Union and Towns, of said state and that, although said suit is attempted to be prosecuted in the name of the State of Georgia, said State is in fact lending its name to said individuals and is only a nominal party to said suit, and that the real parties in interest are the said private citizens and persons residing in said State and counties.

THIRD.

That to the extent that the State of Georgia seeks relief based upon the alleged injuries and damages to her citizens and their property by the operations of defendants, no sufficient reasons are shown authorizing the State of Georgia to assume to act as "**parens patriae,** trustee, guardian or representative" for such citizens.

FOURTH.

Because it appears from the face of said bill that the State of Georgia in her right of sovereignty is seeking to maintain this suit for the redress of the supposed wrongs of certain private citizens and residents of said state, while, under the Constitution of the United States and the laws enacted thereunder, said state possesses no such sovereignty as empowers it to bring an original suit in this Court for such purposes.

FIFTH.

Because it appears upon the face of said bill of complaint that no property rights of the State of Georgia are in any manner affected by the matters alleged in said bill of complaint, nor is there such property right involved in this suit as would give this Court original jurisdiction of this cause.

SIXTH.

In order to authorize this Court to maintain original jurisdiction of this suit as against either of these defendants, it must appear that the controversy set forth in the bill of complaint and to be determined by this Court is a controversy arising directly between the State of Georgia and defendants; **whereas** the bill of complaint shows upon its face that there is no controversy directly arising as between the State of Georgia and defendants, but at most a controversy in which the State of Georgia has a remote and contingent interest.

SEVENTH.

Because said bill, although showing on its face that it is in reality brought to redress the supposed wrongs of certain in-

dividuals of said counties in the State of Georgia, fails to show that said individuals thus alleged to be wronged have no adequate remedy in the Courts of Tennessee, or of the United States, but, on the other hand, shows that said citizens have and are pursuing successfully in the Courts of Tennessee a full, adequate and complete remedy at law for their supposed wrongs and injuries.

EIGHTH.

Because said bill fails to show such a statement of facts as to entitle the plaintiff to an injunction in this cause. It fails to show such a statement of facts as would or could work irreparable injury to the plaintiff, and shows no reason why full, adequate and complete relief can not be had in courts of law.

NINTH.

Said bill is in other respects uncertain, informal and insufficient and does not state facts sufficient to entitle the State of Georgia to the equitable relief prayed for.

Wherefore, and on account of which reasons and for want of a sufficient bill of complaint in this cause, the said defendant prays judgment that the State of Georgia may be barred from having or maintaining the aforesaid action against said defendant, and that this court will not take further cognizance of this cause, and that the said defendant be hence dismissed with its costs.

HOWARD CORNICK,
JOHN H. FRANTZ,
Attorneys for Defendant Tennessee Copper Co.

I, Howard Cornick, certify that I am one of the attorneys and of counsel for defendant, Tennessee Copper Company, in this cause, and that the foregoing demurrer is in my opinion well founded in law.

HOWARD CORNICK,
Attorney for Tennessee Copper Co.

State of Tennessee,
County of Knox.

I, Howard Cornick, upon my oath say that I am one of the attorneys of the Tennessee Copper Company, the foregoing defendant, and that the above demurrer is not interposed for delay.

HOWARD CORNICK.

Subscribed and sworn to before me this the 6th day of November, A. D., Nineteen hundred and five.

T. G. McCONNELL,
Notary Public, Knox County, Tennessee.